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Williams Air Force Base, Arizona

Final
Remedial Investigation Report
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Williams Air Force Base, Arizona

Final
Remedial Investigation Report
Operable Unit 5

Prepared for:

Air Force Center for Environmental Excellence
HSC/PKVCB
Headquarters Human Systems Center
Brooks Air Force Base, Texas 78235-5353
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Project No. 409881

Prepared by:

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May 1996

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13. ABSTRACT *(Maximum 200 words)*

This report comprises a compliance document under the remedial investigation activities at Williams Air Force Base (WAFB), Arizona. The purpose is to determine if and where any contamination may occur at eight (8) sites in Operable Unit 5 (OU-5). The work is under the direction of IT Corporation (IT).

The period of work is planned to be accomplished between June and July 1995. Christine Olguin, AFMC Human Systems Center (PKVCC), is the contracting officer.

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Preface

This remedial investigation (RI) report comprises a compliance document under the RI activities at Williams Air Force Base (AFB), Arizona. The purpose of the work was to complete a contamination removal and verification of cleanliness at Operable Unit (OU) 5. The OU-5 report focuses on the removal actions required at each site and postremoval sampling and analysis to verify that no unacceptable levels of residual contamination remain. The work was under the direction of IT Corporation (IT).

The period of field work was July 1995.

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List of Acronyms

ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AFB	Air Force Base
AST	aboveground storage tank
AV	AeroVironment, Inc.
bgs	below ground surface
BHC	betahexachlorocyclohexane
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COPC	contaminant of potential concern
°F	degrees Fahrenheit
DDE	dichlorodiphenyldichloroethene
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DOD	U.S. Department of Defense
DDT	dichlorodiphenyltrichloroethane
DTIC	Defense Technical Information Center
E/A	evaluation/assessment
E_H	oxidation-reduction potential
EM	electromagnetic
EPA	U.S. Environmental Protection Agency
ES	Engineering Science, Inc.
FAC	field activities coordinator
FFA	Federal Facilities Agreement
FS	feasibility study
FSP	field sampling plan
GCMS	gas chromatography/mass spectroscopy
HAZWRAP	Hazardous Waste Remedial Actions Program
HBGL	health-based guidance level
HI	hazard index
HNUS	Halliburton NUS Corporation
HQ	hazard quotient
HSP	health and safety plan
HUD	U.S. Department of Housing and Urban Development

List of Acronyms *(Continued)*

ICP	inductively coupled plasma
IRP	Installation Restoration Program
IT	IT Corporation
JP-4	jet petroleum grade 4
K_{ow}	octanol-water partition coefficient
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MOTRANS	Multiphase Flow and Transport
msl	mean sea level
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NWS	National Weather Service
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
PPM	priority pollutant metal
PRG	preliminary remediation goal
PVC	polyvinyl chloride
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RPM	remedial project manager
SARA	Superfund Amendments and Reauthorization Act
SLRA	screening level risk assessment
SVOC	semivolatile organic compound
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbon
TWG	Technical Working Group
UCL	upper confidence limit

List of Acronyms *(Continued)*

USAF	U.S. Air Force
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
WWTP	wastewater treatment plant

Executive Summary

The U.S. Department of Defense (DOD) instituted a comprehensive Installation Restoration Program (IRP) to assess the environmental contamination that may have resulted from past operations and disposal practices in DOD facilities and to determine cleanup measures. Federal facilities, including DOD installations, are required by law to adhere to guidelines and procedures set forth by the U.S. Environmental Protection Agency (EPA) for investigation and cleanup of former disposal sites. The goal of the IRP at Williams Air Force Base (AFB), Arizona was to develop an approach for the long-term evaluation and disposition of the sites to protect the public health and environment.

Williams AFB was added to the EPA's National Priority List (NPL) on November 21, 1989. As a consequence of inclusion on the NPL, negotiations were completed between the EPA, U.S. Air Force, Arizona Department of Environmental Quality (ADEQ), and Arizona Department of Water Resources (ADWR) resulting in a signed Federal Facilities Agreement (FFA) on September 21, 1990. The FFA was, among other things, designed to prioritize and schedule the investigation and remedial actions at Williams AFB.

The FFA divided the Williams AFB site into two operable units (OU), OU-1 and OU-2. Subsequently, OU-3 was added to include sites not covered under OU-1 or OU-2. When the Base was nominated for closure in 1992, a facilities assessment was conducted and completed in 1993. The facility assessment provided recommendations to either delete facilities/areas from further consideration, include them for further investigation, include them in the state compliance program, or include them in the IRP program. For those sites designated for further investigation, an environmental assessment was conducted in 1993 and concluded in 1994. Areas that were recommended for further investigation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) were designated as OU-4. OU-5 sites were those recommended for limited removal action and/or risk screening. Category 7 sites were those sites designated for property transfer by the USAF after the sites were determined not to be contaminated.

This remedial investigation (RI) report provides the results of the OU-5 work at the following sites, plus a summary of one site, Sewage Sludge Stockpile Area (Area 28), addressed previously in the Final Phase I Evaluation/Assessment Investigation (IT, 1994b). Although the conclusion in the Final E/A Report was that the sewage sludge stockpile posed no hazard to human health, the Air Force determined that the removal would eliminate any question in

the future about any potential risk. Information on the Sewage Sludge Stockpile is therefore included in this Report to document the actions that were completed and add the actions that have been taken since the E/A Report was issued.

Airfield Underground Storage Tanks (Site ST-25). A drum that contained dark brown soil and rounded gravel was removed from this site. The drum appeared to be a portion of an old seepage pit, but there was no sign of an underlying storm drain line. Two samples were collected and analyzed. Only methylene chloride was detected, in one sample. It was considered to be laboratory contaminant and the concentration was below the Arizona health-based guidance levels (HBGL) and EPA's Region IX residential preliminary remediation goal (PRG) levels.

The risk assessment concluded that the site poses no unacceptable risk to human health or the environment, and the site requires no further action.

Paint Shop Leach Field (Site WP-27). The leach field was excavated and three soil samples were collected and analyzed from the bottom of the excavated area. Nine metals were detected, but only arsenic and beryllium maximum concentrations exceeded the Arizona HBGL and the Region IX residential PRG levels.

Based on subsequent risk analysis, beryllium was not further evaluated because it was within the background range. Thus, beryllium was not considered a contaminant of potential concern (COPC). Arsenic was selected as a COPC. The screening level risk of 3.0×10^{-5}, however, was within the acceptable EPA range of 10^{-6} to 10^{-4}. This site poses no unacceptable risk to human health or the environment, and this site requires no further action.

Sewage Sludge Trenches (Site DP-28). No action was required under the OU-5 removal actions because the Sewage Sludge Trenches were capped as part of the final remedy for the Landfill (LF-04) under OU-1. This action was taken because of the close proximity and common contamination (dieldrin) at both the landfill site and Sewage Sludge Trenches.

Prime Beef Yard (SS-29). Stained soil was excavated northwest of Building 766 and one sample was taken and analyzed. Soil that surrounded the concrete pad at Building 766 was also excavated and three soil samples were collected and analyzed.

Nine metals were detected, but only the maximum concentrations of arsenic and beryllium exceeded the Arizona HBGL and Region IX residential PRG levels. Methylene chloride was also detected, but the concentration was below the Arizona HBGL and Region IX residential PRG levels.

Based upon risk analysis, the mean site concentration for beryllium was less than its background mean concentration and beryllium was eliminated as a COPC. Arsenic was considered as a COPC for further risk analysis. The screening level risk for arsenic was 2.0×10^{-5}, which is within the EPA acceptable range of 10^{-6} to 10^{-4}. It was determined that this site poses no unacceptable risk to human health or the environment. Thus, this site requires No Further Action.

Golf Course Maintenance Area (SS-31). Soil was excavated north of the current aboveground storage tank (AST) locations and two soil samples were taken and analyzed. No contaminants were detected at this site. Thus, this site poses no unacceptable risk to human health or the environment, and this site requires no further action.

Building 1070 (SS-32). The planned activity at this site was to remove the stained soil previously observed in the gravel parking area. However, during a site inspection prior to excavation, no staining was observed. The stain was probably attributed to a rainfall event collecting at a low spot in the area prior to the site observation and once the rain soaked into the ground, or evaporated, there was no stain. The Technical Working Group (TWG) members inspected the site on July 19, 1995, and could not detect any staining or evidence of the previously observed potentially contaminated soil. All members agreed that no action was necessary. Thus, no excavation or sampling was required because this site poses no unacceptable rick to human health or the environment.

Munitions Incinerator (Facility 1119, SS-34). Soil was excavated from a dark stained area located immediately south of the incinerator and two samples were collected from the bottom of the excavated area. Nine metals were detected in one sample and eight in another sample. Only the maximum concentrations of arsenic and beryllium exceeded the background range and the Arizona HBGL and Region IX residential PRG levels.

The mean site concentration for beryllium was less than its background mean concentration, and it was eliminated as a COPC. Arsenic was considered a COPC for further risk analysis.

The screening level risk for arsenic was 1.8×10^{-5} which was within the acceptable EPA level of 10^{-6} to 10^{-4}. This site poses no unacceptable risk to human health or the environment, and this site requires no further action.

Concrete Hardfill Drum Removal Area (LF-26). A 55-gallon drum in the surface drainage ditch was removed, along with the surrounding soil and concrete. Two samples were collected from the bottom of the excavation and analyzed. Low levels of pesticides (4,4-dichlorodiphenyldichloroethene and dieldrin were detected, but both were well below the Arizona HBGL or Region IX residential PRG levels. This site poses no unacceptable risk to human health or the environment, and this site requires no further action.

Sewage Sludge Stockpile Area (Area 28). There were 5 SVOCs, 6 pesticides/PCBs, and 11 metals detected from samples taken from the stockpile area. None of the SVOCs or metals exceeded the Arizona HBGL or EPA residential PRG levels. Only one out of three dieldrin samples collected were above the HBGL and PRG levels.

Due to similarities in chemicals between Area 28 and the Landfill Area (LF-04), a comparison was made with the risk assessment results at LF-04 as reported in the OU-1 Remedial Investigation Report Addendum (IT, 1994a). This report indicated that a maximum risk from dieldrin in soil was 5.8×10^{-6}, which is within the acceptable EPA level of 10^{-6} to 10^{-4}. Thus, dieldrin did not pose an unacceptable risk to human health or the environment. Although no further action was required at Area 28, the Sewage Sludge Stockpile was removed in January 1996 and the material properly disposed in an approved landfill.

Conclusions and Recommendations. Soil and risk analyses indicated that these sites pose no unacceptable risk to human health or the environment. It is recommended that no further remedial action is required to protect human health and the environment at these sites.

1.0 Introduction

This remedial investigation (RI) report prepared by IT Corporation (IT) details activities conducted at Operable Unit (OU) 5 at Williams Air Force Base (AFB), Arizona under the Installation Restoration Program (IRP).

1.1 U.S. Air Force IRP

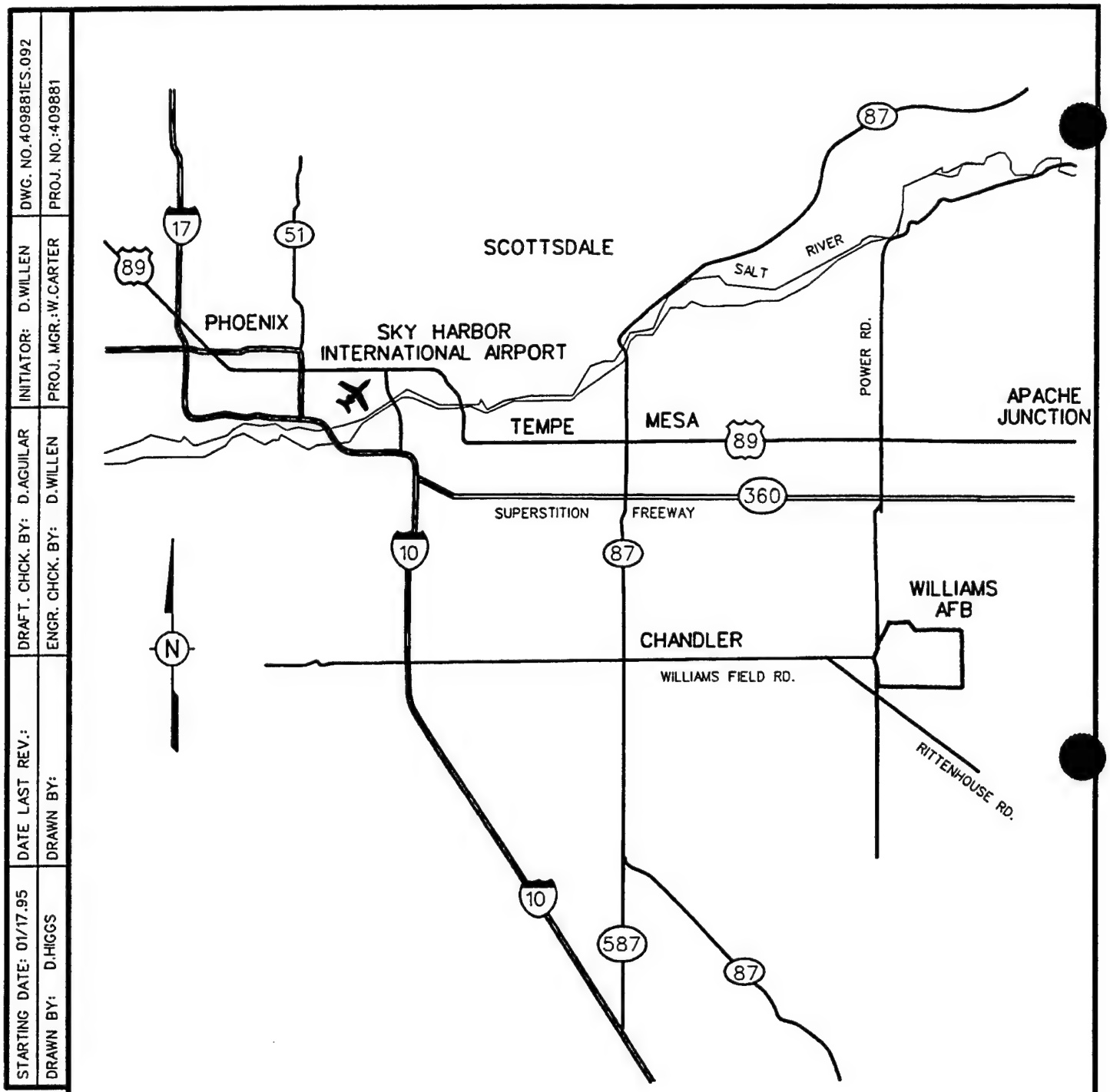
IRP Program Origin. In 1976, the U.S. Department of Defense (DOD) instituted a comprehensive IRP to assess and control migration of environmental contamination that may have resulted from past operations and disposal practices on DOD facilities. In response to the Resource Conservation and Recovery Act (RCRA) of 1976 and in anticipation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or "Superfund," DOD issued a Defense Environmental Quality Program Policy Memorandum (DEQPPM) dated June 1980 (DEQPPM 80-6), which required the identification of past hazardous waste disposal sites on DOD agency installations. The U.S. Air Force (USAF) implemented DEQPPM 80-6 in December 1980. The program was revised by DEQPPM 81-5 (December 11, 1981), which reissued and amplified all previous directives and memoranda on the IRP. The USAF implemented DEQPPM 81-5 on January 21, 1982.

The IRP is DOD's equivalent of the national Superfund program. The Superfund Amendments and Reauthorization Act (SARA), passed by Congress in 1986, requires cleanup of federal facilities to meet Superfund requirements. Additional information on the IRP program can be found in the final work plan and final sampling plan (IT, 1995a,b).

1.2 History of Past IRP Work at Williams AFB

1.2.1 Installation Description

The Base is located southeast of Phoenix, Arizona (Figure 1-1). In 1941, the Base was constructed on 4,042 acres of government land and was immediately commissioned as a flight training school. Training activities with jet aircraft were started in 1949. Throughout its history, pilot training has been the primary activity at the Base. At various times, bombardier, bomber pilot, instrument bombing specialist, and fighter gunnery training schools were also housed on Base. In 1992, as a result of DOD downsizing, the Base was recommended for closure and subsequently closed on September 30, 1993.



SCALE

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FIGURE 1-1
SITE LOCATION MAP

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 01/17.95	DATE LAST REV.:	DRAFT. CHCK. BY: D.AGUILAR	INITIATOR: D.WILLEN
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1.2.2 Previous Investigative Activities and Documentation

The initial assessment study (designated as Phase I) was completed by Engineering Science, Inc. (ES) in 1984 (ES, 1984). Based on a review of available records pertaining to chemical handling and disposal practices, interviews with site personnel, and a site survey of activities at the Base, this study identified several sites where hazardous materials may have been handled or disposed.

In 1987, IT performed a simple removal action for approximately 350 feet of the uppermost portion of the Southwest Drainage System (IT, 1987) under a contract with Martin Marietta Energy Systems, Inc. (now Lockheed Martin Energy Systems) through the Hazardous Waste Remedial Actions Program (HAZWRAP). IT was tasked separately in 1988 to complete an RI/Feasibility Study (FS) at the Base for 13 sites. As part of these efforts, a work plan was issued (IT, 1991a) (which included a Quality Assurance Project Plan [QAPP] and a Health and Safety Plan [HSP]). A field sampling plan (FSP) was also approved and issued (IT, 1991b). The continuation of the RI was initiated in January 1989, and continues to date. The sites investigated in the Base RI included:

- Landfill
- Fire Protection Training Area No. 1
- Fire Protection Training Area No. 2
- Northwest Drainage System
- Southwest Drainage System
- Radioactive Instrumentation Burial Area
- Pesticide Burial Area
- Hazardous Material Storage Area
- Liquid Fuels Storage Area
- Underground storage tanks (UST) at four areas.

The Base was added to the U.S. Environmental Protection Agency (EPA) National Priority List (NPL) on November 21, 1989. As a consequence of inclusion on the NPL, negotiations were completed between EPA, USAF, the Arizona Department of Environmental Quality (ADEQ), and the Arizona Department of Water Resources (ADWR), resulting in a Federal Facilities Agreement (FFA) that was signed on September 21, 1990. The FFA, among other things, agreed to prioritize and schedule the investigation and RAs at the Base.

The FFA divided the Base into two OUs. OU-1 included eight areas identified in previous investigations plus four UST areas (IT, 1992a, 1994a,b). OU-2 comprised the groundwater contamination and shallow (less than 25 feet) soil contamination at the Liquid Fuels Storage

Area (IT, 1992b,c,d). OU-3 was subsequently identified to consider sites not included in OU-1 or OU-2 and included the deep soils (greater then 25 feet to the top of the groundwater zone) at ST-12, the portion of the storm line from Building 53 to the headworks of SD-09, and the Fire Protection Training Area No. 2. OU-3 sites have been investigated and the results reported (IT, 1994c).

In 1992, after the Base was nominated for closure, there was a question of whether all the areas on the Base with potential contamination had been included in the administrative record. This question led to the facilities assessment, which began in February 1992 and was concluded in 1993 (IT, 1993a) in accordance with requirements in the FFA.

The facilities assessment report documented the actions that have been taken to assess facilities not included under the IRP. The report also reviewed the background of each facility and any contamination that might pose a risk to human health or the environment at that location. This process resulted in assessing 92 facilities/areas. Forty-nine facilities/areas were recommended to be eliminated from further consideration, 29 were recommended for further investigation, 12 were recommended for inclusion as part of the State Compliance Program, and 1 was recommended for addition as an IRP site. One area (Southwest Drainage System) was already identified as an IRP site.

The Golf Course Maintenance Area was also added to the sites recommended for further investigation, increasing that list to 30 sites.

In 1993, field and sampling activities were conducted by IT at the 30 designated evaluation/ assessment (E/A) areas on the Base. The purpose of these investigations was to evaluate the areas for the presence or absence of contamination that may have resulted from operations at the Base. The resultant E/A report (IT, 1994b) summarizes the results of the investigation. Areas where the presence of contamination was confirmed were recommended for limited removal action and/or risk screening and were designated as OU-5. Areas recommended for further investigation under CERCLA were designated as OU-4.

This RI report will focus on removal actions for OU-5.

1.2.3 Past Removal Actions

None of the sites in OU-5 have undergone complete removal actions; however, a partial removal action was performed on December 10, 1992 by IT at the Paint Shop Leach Field

(WP-27) concurrent with soil sampling. The rock bed over potentially contaminated soil, as observed visually, was removed prior to soil sampling; then the excavated area was backfilled with clean soil and compacted (IT, 1994b).

1.3 Description of Current Study

1.3.1 Project Objective

The objective of this project was to complete contaminant removal and verification of cleanliness at OU-5. This OU-5 RI report focuses on the removal actions required at each site, and on post-removal sampling and analysis to verify that no unacceptable levels of residual contamination remain for any future reuse of the Base.

OU-5 includes the following eight sites:

- Airfield USTs (Site ST-25)
- Paint Shop Leach Field (Site WP-27)
- Sewage Sludge Trenches (Site DP-28)
- Prime Beef Yard (Site SS-29)
- Golf Course Maintenance Area (Site SS-31)
- Building 1070 (Site SS-32)
- Munitions Incinerator (Facility 1119, Site SS-34)
- Concrete Hardfill Drum Removal Area (Portion of Site LF-26).

The OU-5 investigations are governed under CERCLA rather than RCRA because they do not concern sites where hazardous wastes are being stored as part of continuing operations. One site, the Prime Beef Yard, is covered under a RCRA Part A Permit. Section 2.2.1.4 provides additional discussion on the Prime Beef Yard history. The Sewage Sludge Stockpile Area (Area 28) is included in this report to document actions and results at this site. The history of this site is discussed in Section 2.2.1.9.

1.3.2 Project Management and Responsibility

Key project personnel included the project manager, the program manager, the quality assurance (QA) coordinator, the principal investigator/geologist, the field investigation team leader who will be referred to as the field activity coordinator (FAC) , the data management team leader, the Williams AFB remedial project manager (RPM) and point of contact, and regulatory personnel. The responsibilities of key personnel are summarized in the final work plan (IT, 1995a) and specified in greater detail in the QAPP addendum (IT, 1995c).

1.3.3 Scoping Documents Governing OU-5 Investigations

Work Plan. The work plan addresses the scope of work for OU-5 activities at the Base (IT, 1995a).

Field Sampling Plan. An FSP, prepared by IT, outlines the specific procedures and methodology used during the field work associated with OU-5 (IT, 1995b).

Quality Assurance Project Plan. A QAPP was prepared by IT for completion of field and laboratory investigations that generated data for the RI/FS. An addendum to the existing QAPP was developed to address OU-5 activities (IT, 1995c).

Health and Safety Plan. IT developed an addendum to the HSP for the activities to be performed as part of the OU-4, OU-5, and Category 7 areas investigations (IT, 1995d). The addendum addresses health and safety concerns specifically associated with OU-5.

2.0 Installation Description

2.1 Installation Environmental Setting

2.1.1 Physical Geography

Williams AFB is located approximately 30 miles southeast of Phoenix, Arizona, in the Higley Basin of the Salt River Valley Basin. The Salt River Valley Basin is part of the Basin and Range Physiographic Province, characterized by north-to-northwestward-trending wide, flat alluvial-filled basins that surround the separate steep, rugged, low-relief mountain ranges. The basin is bounded by the McDowell, Usery, Superstition, Santan, South, and Phoenix Mountains.

The Base is drained by the Gila River, which is a tributary of the Colorado River. The Gila originates in southwest New Mexico and flows generally westward to its confluence with the Colorado, approximately 4 miles upstream from the Mexican border. The Gila is approximately 15 miles south of the Base. The Salt River, a major tributary of the Gila, flows approximately 13 miles north of the Base. Flow in the Gila and Salt Rivers is intermittent in the region.

The area around the Base has historically been agricultural, but now is becoming urbanized. The greatest urbanization is occurring west and northwest of the Base.

Terrain. The topography at the Base slopes gently to the west. The highest area on the Base is approximately 1,390 feet above mean sea level (msl) at the southeast corner of the Base. The lowest area is approximately 1,326 feet above msl along the west side of the installation. Surface grade on the Base is approximately 0.4 percent.

Because of the low-to-moderate, 1-year, 24-hour rainfall intensity at the Base, coupled with the flat terrain, erosion potential is low. Flooding at the Base can be expected to be minimal. The installation lies between the 100-year and the 500-year flood level for streams in the Gila River Basin (U.S. Department of Housing and Urban Development [HUD], 1979).

Soils. Two major soil associations are found in the vicinity of the Base. The Mohall-Contine Association is found over much of the Base, and the Gilman-Estrella-Avondale Association is found at the southern boundary of the Base.

The Mohall-Contine and the Gilman-Estrella-Avondale Associations have generally the same characteristics, being well drained and nearly level with slopes of less than 1 percent (U.S. Department of Agriculture, 1974). The Mohall-Contine Association consists of well-drained soils, nearly level loams, and sandy clay loams with old alluvial materials on old alluvial fans. The Gilman-Estrella-Avondale Association consists of well-drained soils, nearly level loams, and clay loams on alluvial fans and floodplains.

2.1.2 Air/Climate

The climate at the Base is similar to that of Phoenix and of the rest of the Salt River Valley. Temperatures range from very hot in the summer to mild in winter. Many winter days reach more than 70 degrees Fahrenheit (°F) and typical high temperatures are in the 60s. In the summer months, the normal high temperature is greater than 90°F from early May through October and more than 100°F from early June through September. The majority of rain comes during two seasons: from late November until early April there are periodic rains from Pacific storms, and in July and August the moisture from the south and southeast usually results in frequent thunderstorm activity (Ruffner and Bair, 1987). Annual precipitation is approximately 7.1 inches, and afternoon humidities range from approximately 30 percent in winter to approximately 10 percent in summer. Normal precipitation events range from 0.14 inch in May to 1.02 inches in August. The rainfall intensity is low, with the maximum recorded rainfall in a 24-hour period being 3.07 inches in August 1943 (Bair, 1992). The mean annual pan evaporation is approximately 100 inches per year and the annual lake evaporation for the area is approximately 72 inches (National Oceanic and Atmospheric Administration [NOAA], 1977).

The Base, as well as the rest of the Salt River Valley, is characterized by light winds. High winds associated with thunderstorms occur periodically in the summer. Thunderstorm winds can occur any month of the year, but are rare outside the summer months. Persistent strong winds of 30 miles per hour or more are rare except for two or three events in an average spring, which are caused by Pacific storms (National Weather Service [NWS], 1985). Winter storms rarely bring high winds because of the relatively stable air in the valley.

2.1.3 Geology

The Base lies in the eastern portion of the Basin and Range Physiographic Lowlands Province of south central Arizona. The local topography is controlled by large-scale normal faulting that has resulted in the formation of broad, flat, alluvial-filled valleys separated by steep isolated hills and mountain ranges. The Base is located in the Salt River Valley; the Usery

Mountains are to the north, the Santan Mountains are to the south, the Superstition Mountains are to the east, and the South Mountains are to the west.

According to Laney and Hahn (1986), the Base is underlain by six geologic units: crystalline rocks, extrusive rocks, red unit, lower unit, middle unit, and upper unit. The crystalline and extrusive rocks compose the surrounding mountains and the basement complex underlying the consolidated and unconsolidated sediment of the valley. The four units overlying the basement complex are sedimentary in origin and are composed of locally derived material from the surrounding mountains and local drainage.

The crystalline rocks composing the mountains and basement complex are of Precambrian to Mesozic Age, and the overlying fluvial and lacustrine sediment are of Cenozoic Age (Eberly and Stanly, 1987). The extrusive rocks consist of rhyolitic and basaltic pyroclastic and flow rocks of Middle to Late Tertiary Age (Laney and Hahn, 1986).

The red unit immediately overlies the basement complex and is composed of well-cemented breccia, conglomerate, sandstone, and siltstone of continental origin with interbedded extrusive flow rocks. Because the unit was deposited before the large-scale normal faulting that resulted in the formation of the basin and range, this faulting has subsequently modified the surface of the red unit to produce an irregular contact between it and overlying units.

The lower unit overlies the red unit and consists of playa, alluvial fan, and fluvial deposits with evaporites and interbedded basaltic flows present in lower sections. The unit reaches 600 feet in thickness near the mountains and may reach 10,000 feet in thickness in central portions of the basin. The maximum depth of the basin east of the City of Chandler may be more than 11,000 feet, determined on the basis of gravity measurements. Deposits near gravity lows consist largely of silt- and clay-size material and contain as little as 10 percent sand and gravel (Laney and Hahn, 1986, specifically, Figure 4).

The middle unit overlies the lower unit and is composed of playa, alluvial fan, and fluvial deposits with no associated evaporites. This unit received its sediment primarily from the Salt River, whereas the lower units had the local mountains as the principal source. This unit ranges in thickness from less than 100 feet near the mountains to approximately 1,000 feet near the Base (Laney and Hahn, 1986).

The younger, uppermost unit in the stratigraphic sequence is referred to as the upper unit. The unit consists of channel, floodplain, terrace, and alluvial fan deposits of largely unconsolidated silt, sand, clay, and gravel. Regionally, the upper unit ranges from approximately 200 to 300 feet thick in the central part of the basin and thins to a veneer toward the mountains. At the Base, the upper unit is approximately 150 feet thick. Regionally, the upper unit was deposited from the Salt River and Queen Creek drainage systems. At the Base, however, sediment was deposited by the Queen Creek drainage during a period of land subsidence (Laney and Hahn, 1986)

2.1.4 Hydrogeology

Because of pumping groundwater for agricultural purposes, an extensive vadose zone has been produced in the vicinity of the Base. Groundwater beneath the Base is encountered at approximate depths of 180 to 250 feet. Although a two-aquifer system has been proposed, the concept of a two-aquifer system may be too simplistic when trying to characterize the hydrogeology beneath the Base. It is more likely that there is a complex, stratified aquifer system, which is interconnected both vertically and horizontally to varying degrees across the Base. There was no attempt to determine the three-dimensional aquifer geometry over the entire Base, but to determine the degree of aquifer interconnection on a local site-by-site scale. Therefore, the extent of individual units was not determined. The saturated section(s) at the Base may be equivalent to the lower portions of the upper unit (as previously defined in Section 2.1.3) or it may be equivalent to the middle unit.

Groundwater elevation contour maps have been produced for the western half of the Base, where groundwater monitoring wells exist. This information is presented in the OU-1 and OU-2 RI reports (IT, 1992a,b), and the OU-3 RI report (IT, 1994c). The maps indicate that groundwater flows to the north and east on a Basewide scale. These maps are consistent with other groundwater elevation contour maps presented for the area (Laney and Hahn, 1986; AeroVironment, Inc. [AV], 1987).

A general rise in groundwater elevations has been observed in monitoring periods from December 1989 to present at a rate of 3 to 5 feet per year. Rising groundwater levels may be attributed to decreased local pumping due to urbanization and larger surface water use, increased recharge from additional agricultural irrigation, and increased recharge from unusually rainy periods over the past 10 to 15 years.

2.1.5 Surface Water

The drainage channels at the Base empty into the Roosevelt Water Control District floodway that flows southward in the vicinity of the Base. The floodway lies between the Roosevelt Canal and the Base's western boundary. The Base elevation is between the 100-year and 500-year flood level for streams in the Gila River Basin (HUD, 1979).

Storm drainage on the Base is directed to a combination of open channels and underground structures. Open channels are used to drain most of the Base; underground drainage structures are generally limited to the aircraft ramp area. Storm drainage from the Base flows either to the drainage channels around the Base or directly to the floodway west of the Base. Erosion potential across the Base is low because of the low-to-moderate, 1-year, 24-hour rainfall intensity at the Base, coupled with flat terrain.

2.1.6 Demography and Land Use

Williams AFB is relatively small compared to most other USAF bases. The Base was closed on September 30, 1993 and transitioned from the Air Force's Air Training Command to the Air Force Base Conversion Agency. This agency is working with the local community through the Restoration Advisory Board (RAB) and the Williams Redevelopment Partnership. The partnership will maximize reuse for aviation, education, commercial, and industrial uses. The Base has been divided into potential reuse parcels according to airfield, commercial, aviation support, air cargo, general industrial, education/research/training, institutional/ medical, and schools. The golf course has been leased. Leases are being negotiated for several industrial areas. Universities are also considering establishing portions of their campuses at the Base.

The Base is relatively isolated from any large metropolitan area. Located in Maricopa County, it is surrounded mostly by agricultural land. Smaller urban areas such as Mesa, Gilbert, and Apache Junction are 5 to 15 miles away. The Queen Creek and Chandler Heights areas are approximately 5 miles south and west of the Base boundary, respectively. These areas are relatively isolated with primarily cultivated and uncultivated land separating them.

A development plan for the region (Sunregion Associates, 1987), if implemented, will dramatically alter the surrounding region around the Base. The portions of the proposed plan of most concern are the East Mesa Subarea Plan and the Queen Creek-Chandler Heights Plan. The former proposes development for portions of the City of Mesa, the Town of Gilbert, the

City of Apache Junction, and the land area north of the Base. The proposed land area for the Queen Creek-Chandler Heights Plan is east of Chandler, just south of the Base in the approximate location of the Town of Queen Creek. The objective is to develop the proposed areas residentially and commercially over a 25-year period.

In 1970, the Queen Creek-Chandler Heights Plan area had a population of 1,516. The population increased to 3,916 from 1980 to 1985. From this 1985 number, the population is projected to increase to 13,248 persons in 2005. In comparison, during the 1985 to 2005 period, Maricopa County's population is projected to increase by 80 percent. In the East Mesa Subarea Plan, the population in 1970 was 13,135. From 1970 to 1985, it increased to 46,445. Population projections from 1985 to 2005 show an expected increase of approximately 130 percent.

The previously mentioned East Mesa Subarea Plan proposes to develop the land south of the Base to within 2 miles of the Base boundary, whereas the existing northern development is more than 4 miles away. The Queen Creek-Chandler Heights Plan proposes to develop the land to the edge of the Base's southern boundary (Pecos Road); the existing southern development is approximately 3 to 5 miles away.

This development plan may be altered by the recommendations of a noise exposure and land-use compatibility study sponsored by the Maricopa Association of Governments. The objective of this study was to "accommodate the development needs of surrounding jurisdictions while preserving the military missions of Williams AFB" (Barnard Dunkelberg & Company and Mestra Greve Associates, 1988). The study was prompted in part by state law, which requires cities, towns, and counties in the vicinity of a military airport to adopt land-use plans and zoning regulations that are compatible with military airport operations. However, because Base closure has occurred, land-use plans and zoning regulations may change.

After analysis of existing and projected noise contours resulting from the past Base operations, recommendations were made for mitigating noise impacts in the area. These recommendations include limiting land use within the most heavily impacted areas. These recommendations will preclude new residential development within the projected 65-decibel noise contour, which extends 1 to 4 miles beyond the east, southeast, and northwest boundaries of the Base. Restricted development is recommended for areas within the 60-decibel noise contour and a projected oversight area. These areas extend 1 to 6 miles beyond the

boundary of the Base in all directions; however, land-use limitations due to noise impacts within these areas may be lifted in the future because of Base closure and the termination of Base operation.

2.1.7 Ecology

An ecological assessment of the Base was performed by IT in 1993. The following text is summarized from the Basewide baseline ecological risk assessment report (IT, 1993b).

The Base is located on a mostly level plain that is part of the lower Sonoran Desert. A hot, dry climate and lack of varied topography have resulted in a relatively uniform scrub-shrub community dominated by creosote bush and other desert shrubs adapted to low rainfall conditions. Cacti and succulents typical of the Sonoran Desert occur infrequently on the plain. Narrow strips of riparian vegetation dominated by velvet mesquite and other trees, shrubs, and grasses border ephemeral washes and drainageways (MacMahon, 1985; Polis, 1991). No large areas of riparian vegetation typically associated with perennial streams in the Sonoran Desert occur at the Base. Much of the native vegetation at the Base has been disturbed by human activities. However, a number of species used for landscaping at the Base are either native to Arizona or accustomed to desert climates (Disposal Environmental Impact Statement, 1993).

Landscaped vegetation, approximately 875 acres, includes all vegetation on the Base that is dependent upon irrigation. This vegetation covers nearly the entire western third of the Base, including all urbanized areas, Base housing, Willie Park, and the golf course.

Most of the central third of the Base, including lands between and surrounding runways and hangars, supports sparse grassland cover that is regularly mowed but not irrigated (approximately 1,858 acres, of which approximately 247 acres is paved). No woody plants and few other herbaceous plants have been reported in these areas, although either western ragweed or Bermuda grass was dominant in several mowed runoff ditches.

Most lands north, east, and south of the Base runways support vegetation dominated by shrubs native to the lower Sonoran Desert (approximately 1,254 acres). Creosote bush is dominant in most areas not previously subjected to heavy disturbance. Saltbush and tomatillo are codominant with creosote bush in many areas north and east of the airstrip. A large barren area east of the runways supports a sparse stand of crucifixion thorn and desert grasses. Two large areas, one near the Base's northeastern corner and a second near the

Base's south central boundary, which have been used to deposit hardfill, support dense stands of desert broom with a ground cover of red broom (MacMahon, 1985; Elmore and Janish, 1976).

Narrow zones (approximately 55 acres) of riparian vegetation border ephemeral washes and drainage ditches. Two ephemeral washes of natural origin crossing the Base's northern boundary support riparian vegetation dominated by velvet mesquite and blue palo verde, both small trees native to undisturbed swamp/marsh areas in the lower Sonoran Desert. Two drainageways east of the runways and one southwest of the runways are bordered by dense stands of desert broom, a native shrub characteristic of disturbed swamp/marsh areas. The deeply cut northern and eastern perimeter drainage ditches support a moderately dense cover of desert broom and composite shrub. Centers of many washes and ditches are largely barren of vegetation due to brief episodes of rapidly running water.

Wildlife. The ecological risk assessment report (IT, 1993b) provides a list of mammals, birds, insects, amphibians, and reptiles observed at the Base study sites, and mammals, birds, amphibians, and reptiles seen utilizing Base habitat, but not necessarily at a study site.

Aquatic Habitat. Aquatic habitats on the Base are limited to ephemeral drainages and manmade ponds. Ephemeral drainages typically support aquatic insects (e.g., mosquitos and flies) and other species that need water for only part of their lifecycle. The concrete-lined Powerline Floodway, located along the northeast boundary of the Base, joins with the north Base perimeter flood channels. At their junction is a small pond that supports bullfrogs and Colorado River toads (Sonoran Desert toad). This pond also is a watering hole for javelina and coyote, as evident by tracks observed on the edges. Another pond is located near the southwest boundary of the Base. This pond is surrounded by seep-willow and provides habitat for birds and toads (Halliburton NUS Corporation [HNUS], 1992). During the August 1993 field study, the presence of this pond was confirmed; however, no water was present.

Endangered, Threatened, Special Concern, and Protected Species. These are species and/or habitats protected by the Federal Endangered Species Act, Migratory Bird Treaty Act, or state resource protection regulations. A number of federal and state threatened, endangered, or special concern species are known to be present in the vicinity of the Base (Arizona Department of Agriculture and Horticulture, 1992; Arizona Game and Fish Department, 1988; Christofferson, 1992; Spiller, 1992).

Numerous loggerhead shrikes, a Federal Candidate (Category 2) species, have been observed at different locations on the Base. Loggerhead shrikes prefer a semiopen country and use wires, trees, and scrub for lookout posts. With the exception of urban areas, the Base has an abundance of this type of habitat.

Signs of kit fox, which is a federally listed endangered species, were seen near the landfill.

Species that are present on the Base and protected by the Arizona Native Plant Law (Arizona Revised Statutes, Chapter 7), Salvage Restricted category, are barrel cactus, Jerusalem thorn, and crucifixion thorn. Under the Salvage Assessed category are the Jerusalem thorn, blue palo verde, and honey mesquite. These three species are also protected under the Harvest Restricted category (HNUS, 1992).

The 1988 State List of Threatened Native Wildlife in Arizona was obtained from the Arizona Game and Fish Commission. No species on the list were observed at the Base. There were indications at the Landfill of the presence of the desert tortoise, which is listed as a State Candidate species, but there is no corresponding status in Arizona under the Federal Endangered Species Act.

There is no designated critical habitat, as defined by the Endangered Species Act, present at the Base.

2.2 Site-Specific Environmental Setting

Because the eight sites included in the OU-5 RI are in such close proximity, the site-specific environmental setting is the same as the installation environmental setting discussed in Section 2.1.

2.2.1 History of Contaminant Investigations

The eight OU-5 RI sites plus the Sewage Sludge Stockpile Area (Area 28) are listed in Table 2-1. The following discussion summarizes existing information at each site prior to OU-5 removal actions (IT, 1994b; IT, 1993a; HNUS, 1993).

2.2.1.1 Airfield USTs (ST-25)

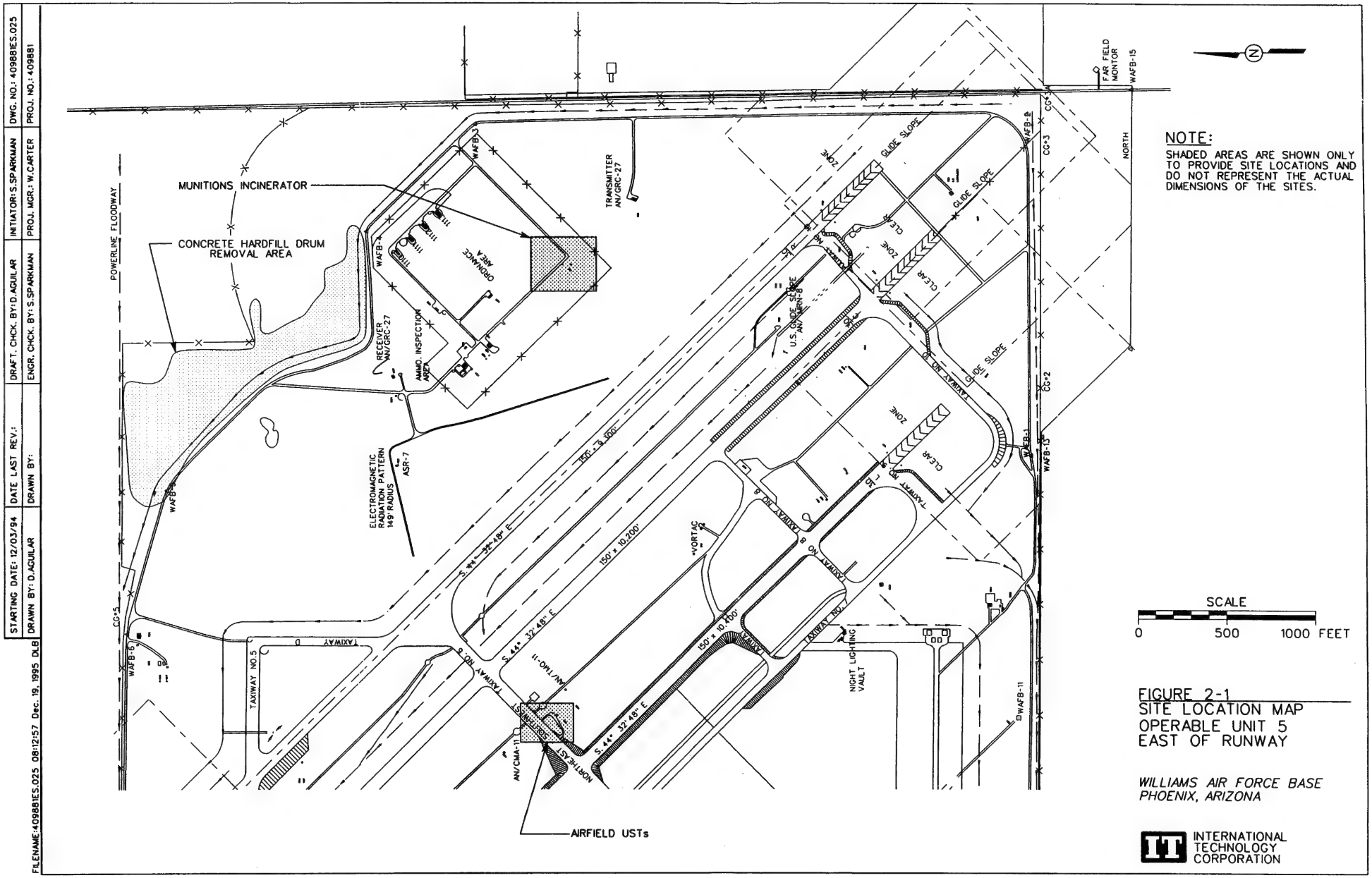
The Airfield UST area is located between the Runway 12R-30L and Runway 12C-30C, adjacent to Taxiway No. 6 (Figure 2-1). The USTs were believed to be located approximately 85 feet south of Taxiway No. 6. The area consists of an asphalt turnout from the

Table 2-1

Remedial Investigation Sites
Operable Unit 5
Williams Air Force Base, Arizona

Site Description	Site Number	E/A Report Area	Building
Airfield Underground Storage Tanks	ST-25	2	N/A[a]
Paint Shop Leach Field	WP-27	18	N/A
Sewage Sludge Trenches	DP-28	20	N/A
Prime Beef Yard	SS-29	26	N/A
Golf Course Maintenance Area	SS-31	30	N/A
Building 1070	SS-32	N/A	1070
Munitions Incinerator	SS-34	6	1119
Concrete Hardfill Drum Removal Area	LF-26	3	N/A
Sewage Sludge Stockpile Area	N/A	28	N/A

[a]N/A - Not applicable.



NOTE:
SHADED AREAS ARE SHOWN ONLY TO PROVIDE SITE LOCATIONS AND DO NOT REPRESENT THE ACTUAL DIMENSIONS OF THE SITES.

SCALE
0 500 1000 FEET

FIGURE 2-1
SITE LOCATION MAP
OPERABLE UNIT 5
EAST OF RUNWAY

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 12/03/94	DATE LAST REV.:	DRAFT. CHCK. BY: D.AGUILAR	INITIATOR: S.SPARKMAN	DWG. NO.: 40988IES.025
DRAWN BY: D.AGUILAR	DRAWN BY:	ENGR. CHCK. BY: S.SPARKMAN	PROJ. MGR.: W.CARTER	PROJ. NO.: 409881

FILENAME:40988IES.025 08:12:57 Dec. 19, 1995 DLB

taxiway, a concrete pad area, and suspect manway and vent or fill hole to the UST (Figure 2-2). There are no buildings near the area.

Several reports indicate that USTs may have been located in the area of the airfield. Reportedly, at one time the Base had a rapid refueling operation for the airplanes. This would require fuel tanks to be located near the taxiways. IRP personnel inspected the airfield on April 10, 1992. Several pipes had been damaged by lawn mowers along the runways; however, only one pipe appeared to be a possible fill pipe for a UST or a sump. This pipe is located approximately 120 feet south of Taxiway No. 6. The suspected manway is located north of the concrete pad, and the vent is south of the pad.

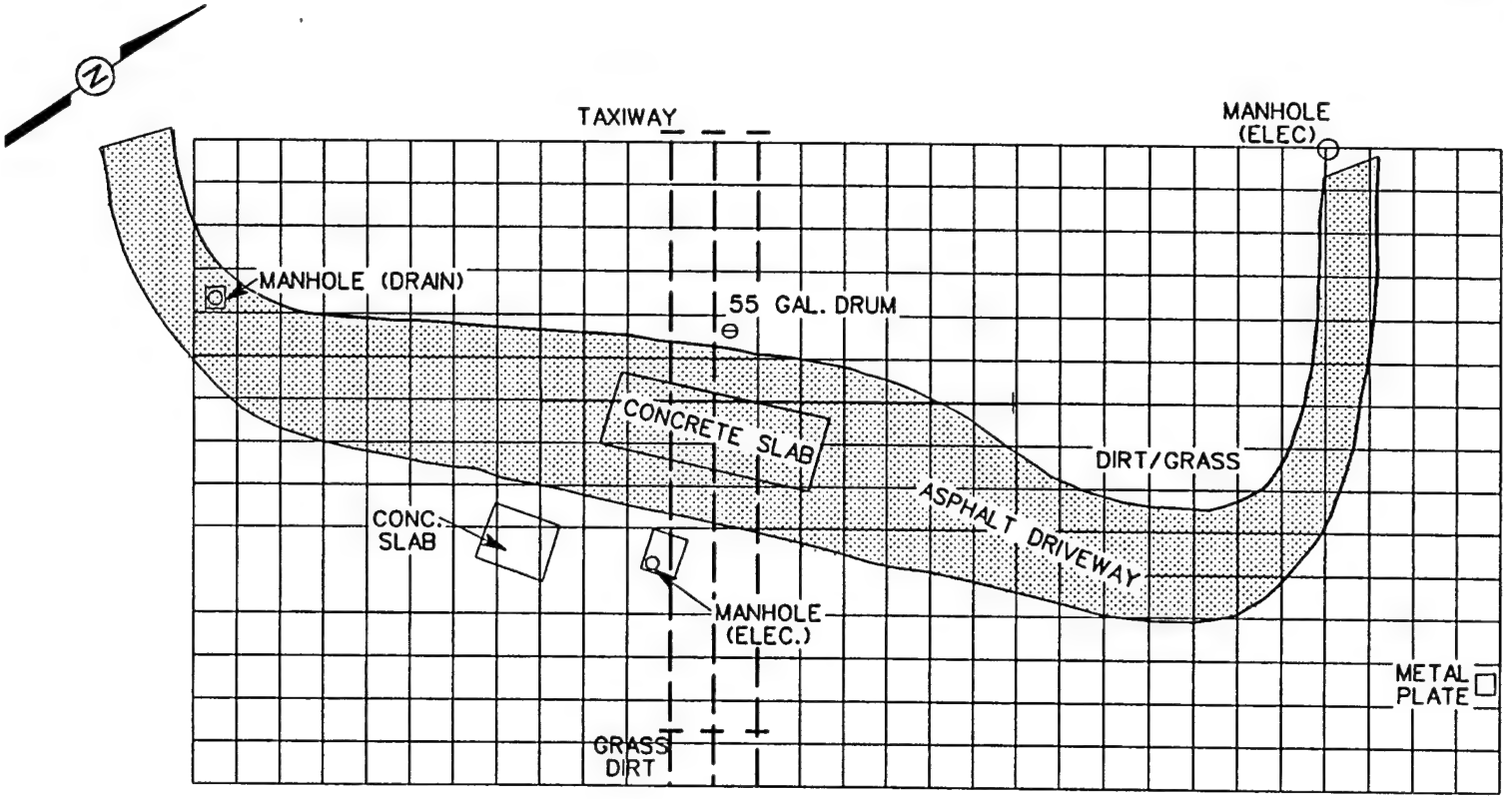
During the E/A investigation (IT, 1994b), a geophysical survey of the Airfield UST area was performed. Total field magnetic and electromagnetic (EM) conductivity data were collected at the area using an EG&G 822-L cesium vapor magnetometer and a Geonics EM-31 DL Terrain Conductivity Meter.

Analysis of the geophysical survey results indicated that no USTs were present at the Airfield USTs area. The suspected vent or fill hole was identified as a light pole that had been cut off near ground level. However, one 55-gallon drum was confirmed to have been buried upright at the location of the suspected manway, and above an underlying storm drain line. The soil inside this drum was removed and the presence of a bottom to the drum was confirmed; however, no environmental samples were collected. There was no visible indication of contamination in the soil, and the soil was returned to the drum.

The Airfield UST location was not recommended for further investigation in the E/A. However, the drum and soil removal action was recommended to verify the removal and/or absence of contaminants.

2.2.1.2 Paint Shop Leach Field (WP-27)

The Paint Shop Leach Field area was located in the central part of the Base, south of "A" Street, north of Adams Street, west of 5th Street, and east of 11th Street (Figure 2-3). The Paint Shop (Building 771) facility was constructed in 1984 and was used for mixing and storing paints. The leach field (8 by 12 feet) shown beside Building 771 (Figure 2-4) was reportedly used to dispose of excess and waste paint. Latex paint was reportedly the primary liquid disposed of in the leach field. Base personnel reportedly would carry paint brushes and rollers to be cleaned to the sink location to be washed. The sink contents drained to the leach



LEGEND:

MAGNETOMETER/EM GRID

GPR SURVEY LINES

SCALE

0 80 160 FEET

FIGURE 2-2
GEOPHYSICAL SURVEY
MAP AIRFIELD USTs

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 12/02/94	DATE LAST REV.:	DRAFT. CHCK. BY: D.AGUILAR	INITIATOR: S.SPARKMAN
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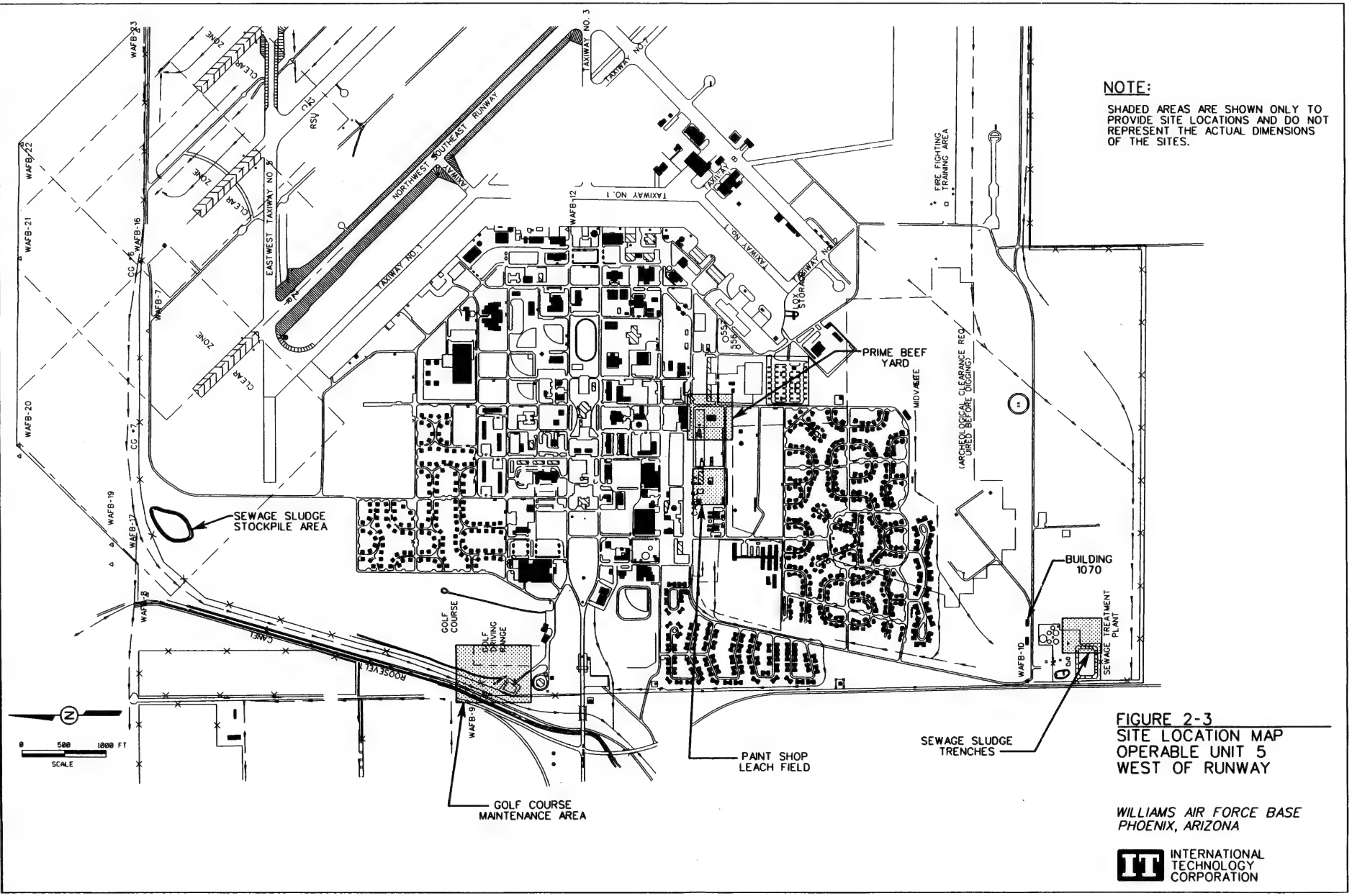

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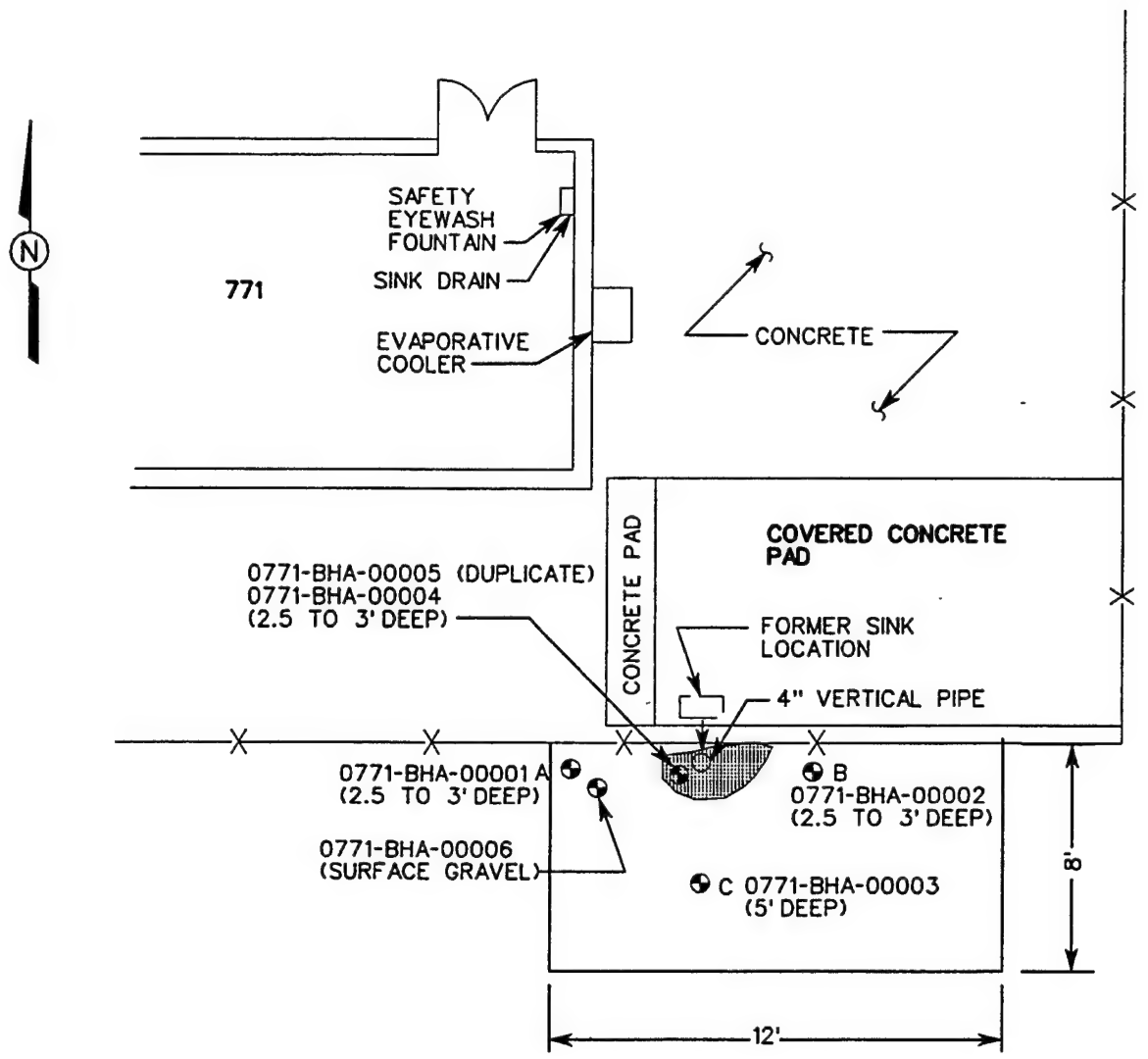
FIGURE 2-3
SITE LOCATION MAP
OPERABLE UNIT 5
WEST OF RUNWAY

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION



LEGEND:

- FENCE
- SOIL SAMPLE LOCATIONS - 12/10/92
- FORMER SINK LOCATION. CONNECTED TO LEACH FIELD BY A PVC PIPE
- DRIED LATEX PAINT

NOTES:

1. SAMPLE LOCATIONS WERE APPROXIMATELY 4 FEET FROM THE 4" VERTICAL PIPE. FINAL LOCATIONS TO BE FIELD DETERMINED AND DOCUMENTED.
2. SAMPLE DEPTHS SHOWN ABOVE.
3. SAMPLE NUMBERS 0771-BHA-0000X.

NOT TO SCALE

FIGURE 2-4
SITE LOCATION MAP
FORMER PAINT SHOP
LEACH FIELD, BLDG. 771

WILLIAMS AIR FORCE BASE
PHOENIX ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 12/12/94 | DATE LAST REV.: | DRAFT. CHCK. BY:D.AGUILAR | INITIATOR: S.SPARKMAN | DWG. NO.:409881ES.048
DRAWN BY:D.AGUILAR | DRAWN BY: | ENGR. CHCK. BY: S.SPARKMAN | PROJ. MGR.:W.CARTER | PROJ. NO.:409881

FILENAME: 409881ES.048 13:36:52 Nov. 15, 1995 DAA

field through a polyvinyl chloride (PVC) pipe. The leach field was comprised of a 2- to 3-foot-thick rock bed on top of soil.

During the investigation prior to the E/A, the rock leach bed that was overlying the area was removed, and environmental and QA/quality control (QC) samples of the underlying soil were collected to determine the degree of contamination (IT, 1994b). The surface gravel was also sampled. The excavated area was backfilled with clean soil and compacted.

Four soil samples plus one duplicate were collected and analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), total petroleum hydrocarbons (TPH), and priority pollutant metals (PPM).

Di-n-butyl phthalate was detected at a level below both the Arizona health-based guidance level (HBGL) and EPA Region IX residential preliminary remediation goals (PRG). The level of TPH (135 milligrams per kilogram [mg/kg]) exceeded the existing Arizona UST regulatory guideline of 100 mg/kg at that time.

Analytical results for PPMs from the Paint Shop Leach Field area were also compared with the Base-specific background ranges. Arsenic was above its Base-specific background range at locations 01 and 06 (Figure 2-4), and was less than the Base-specific background range at locations 02, 03, 04, and 05. Beryllium exceeded the Base-specific background range at all locations except 06, where it was not detected. Chromium and nickel were detected at concentrations above their respective Base-specific background ranges at locations 01, 02, 04, and 05, but were within or below their respective Base-specific background ranges at locations 03 and 06. Lead was above the Base-specific background range at location 01, but was within this range at locations 02 through 06. Mercury was detected at location 05 only, where it exceeded its Base-specific background range. At all six locations, zinc exceeded its Base-specific background range.

Arsenic exceeded its EPA Region IX residential PRG, as well as the Arizona HBGL, at all locations. Beryllium was consistently detected at levels exceeding both the EPA Region IX residential PRG and the Arizona HBGL. All other PPMs detected were at levels below both the EPA Region IX residential PRG and the Arizona HBGL.

It was recommended that the leach field be excavated and samples collected from the excavated area to confirm contamination removal.

2.2.1.3 Sewage Sludge Trenches (DP-28)

The Sewage Sludge Trenches area is located east and south of the Base wastewater treatment plant (WWTP) on the southwest corner of the Base, just south of Perimeter Road (Figure 2-3). Information obtained from visual inspection and aerial photographs indicate that the trench area consists of three trenches ranging in length from approximately 140 to 350 feet, and 40 to 50 feet wide (Figure 2-5). According to the Phase I Records Search, the WWTP digesters were out of service from 1973 to 1979, and undigested sludge was directed to the trenches adjacent to the plant. In 1976, the Base removed sludge collected since 1973 from the trenches and disposed of it in the Landfill. In 1979, when the digesters were reactivated, the undigested sludge collected from 1976 to 1979 was also buried in the trenches.

On September 20, 1993, soil samples were collected from a depth of 10 to 20 inches at each of the six sample locations indicated in Figure 2-5. Soil samples were analyzed for SVOCs, pesticides/polychlorinated biphenyls (PCB), and PPMs.

Analytical results for PPMs from the Sewage Sludge Trenches area were compared with the Base-specific background ranges. Arsenic was detected at locations 20-01, 20-02, and 20-05 (Figure 2-5) at levels above its EPA Region IX residential PRG value; however, only one detection was above the Base-specific background. Beryllium was detected at all six locations above its EPA Region IX residential PRG; however, these detections occurred at levels below Base-specific background. All other PPMs detected in the Sewage Sludge Trench samples were above Base-specific background but were below their EPA Region IX residential PRGs or HBGLs.

Dieldrin was detected above both the HBGL and the EPA Region IX residential PRG at locations 20-01, 20-02, and 20-04. At locations 20-03, 20-05, and 20-06, dieldrin was detected above the EPA Region IX residential PRG but below the HBGL. All other pesticides reported were at levels below both the HBGL and EPA Region IX residential PRG guidance levels. Six polynuclear aromatic hydrocarbon (PAH) SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]perylene, and chrysene) were detected at 20-06. Benzo(a)pyrene was detected at concentrations greater than its Region IX residential PRG, but less than its HBGL. All other PAHs detected were less than the Region IX residential PRG and HBGL levels.

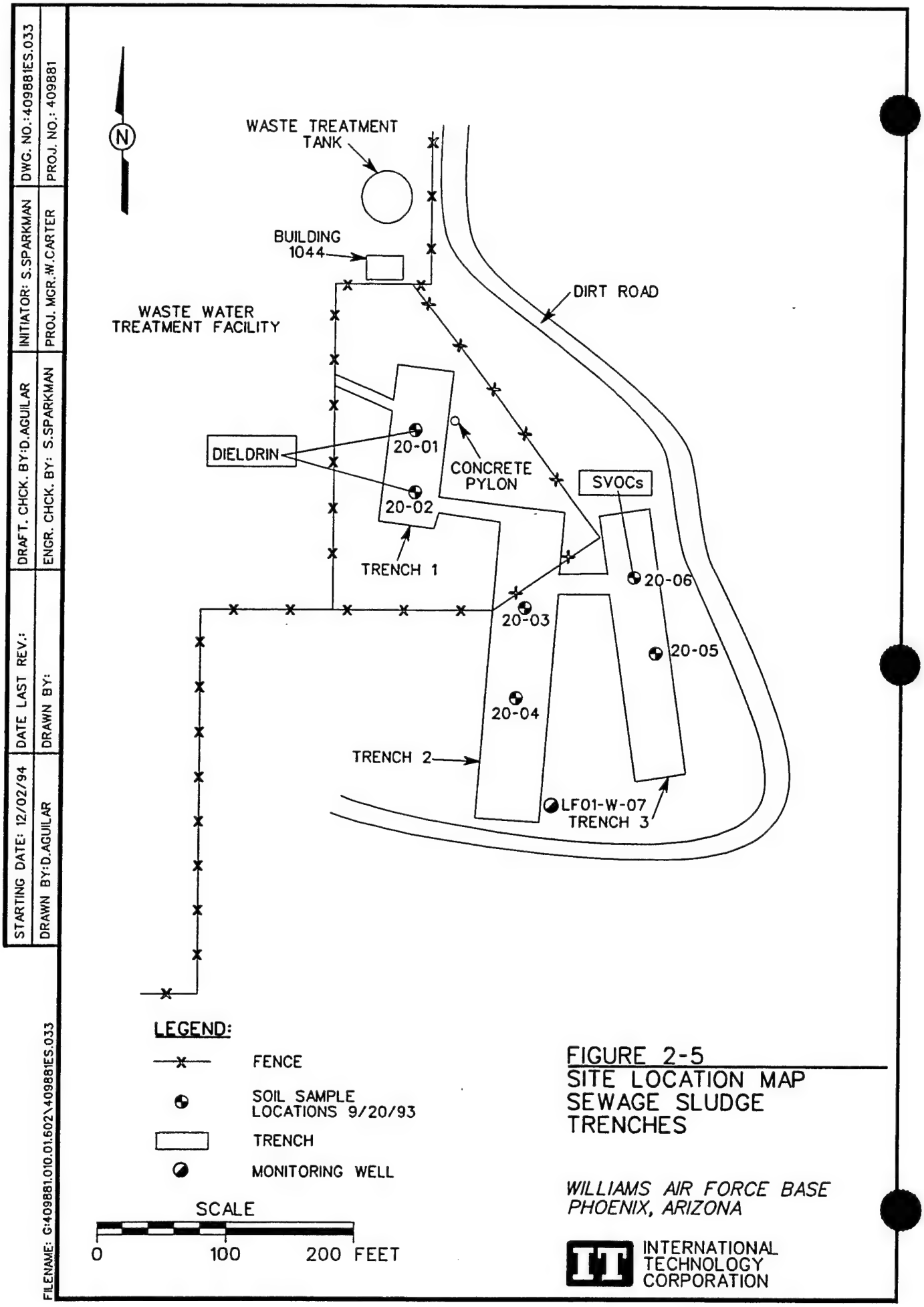


FIGURE 2-5
SITE LOCATION MAP
SEWAGE SLUDGE
TRENCHES

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

2.2.1.4 Prime Beef Yard (SS-29)

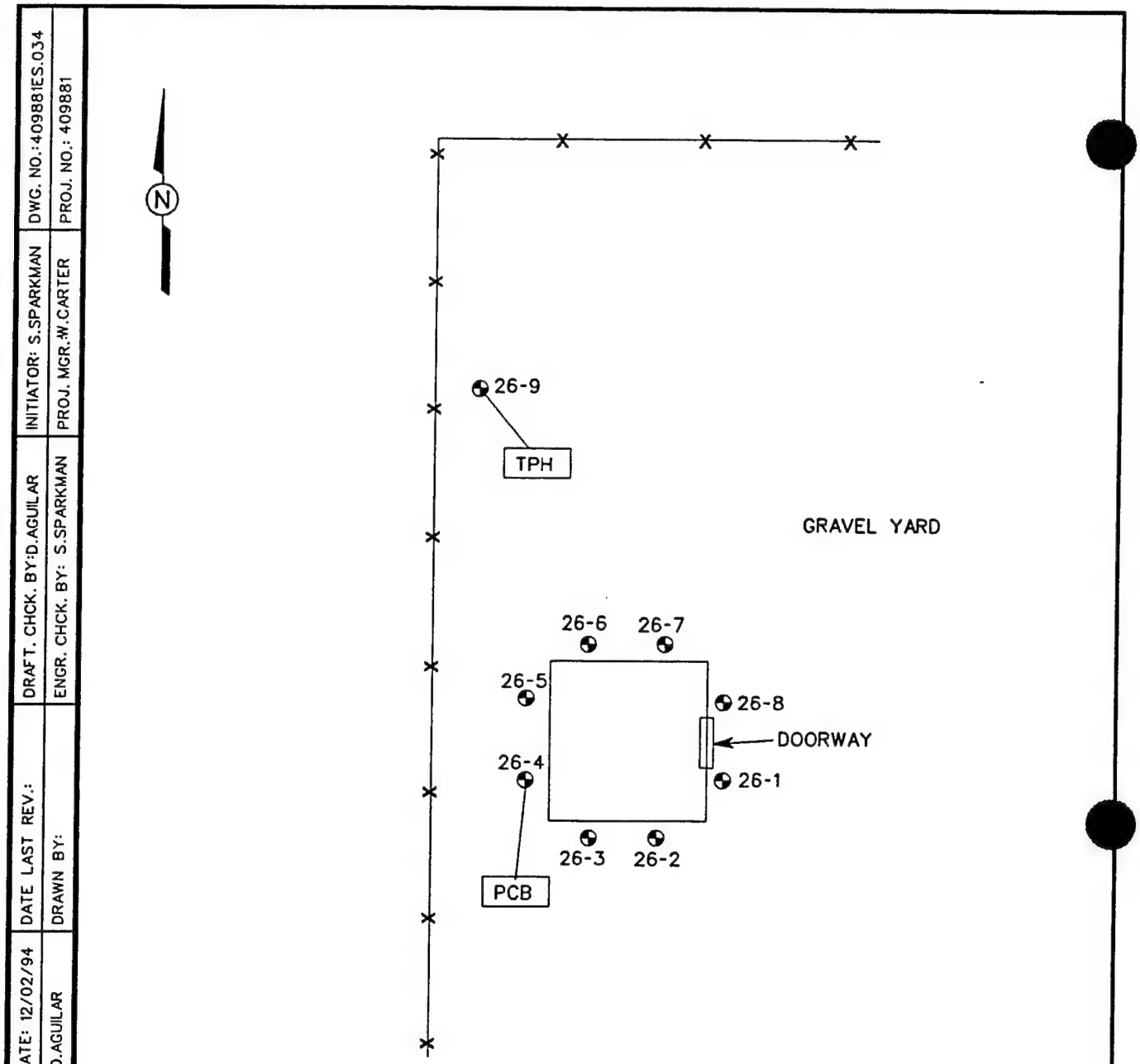
The Prime Beef Yard is located in the central portion of the Base, east of 11th Street, west of 5th Street, north of Adams Street, and just south of A Street (Figure 2-3). This storage yard was used by the Base for storage of construction materials. Although listed as the storage facility in the Base's RCRA Part A Permit, it has never been used for this purpose. Low levels of constituents were detected during the E/A investigation. Based on this fact, agreements were made by the EPA, ADEQ, and ADWR that the Prime Beef Yard would be investigated under OU-5, with removal actions as necessary prior to sampling to verify that there are no residual contaminants at this site that constitute a hazard to human health and the environment. The site will be formally closed, however, under a RCRA Closure Plan. RCRA is applicable to no other sites in OU-5.

A temporary building in the area built on monolithic concrete pad was used for storage of PCB-contaminated transformers until they could be disposed of by the Base. No spills or releases were documented from the transformer storage building. The area is presently used as the location of the pump station for a horizontal well.

Because full characterization is required by ADEQ to close the area, the RCRA section of ADEQ has agreed to transfer the closure to CERCLA under IRP. Further investigation of the temporary building for PCB contamination and one stained area in the northwest corner of the surrounding fenced yard for TPH contamination was accomplished during the E/A because transformers had been temporarily staged there (IT, 1994b).

Soil samples were collected at nine locations as indicated in Figure 2-6. Soil samples from locations 26-01 through 26-08 were analyzed for PCB/pesticides, and the soil sample from location 26-09 was analyzed for TPH.

All detections of dichlorodiphenyldichloroethene (DDE), dichlorodiphenyltrichloroethane (DDT), and beta hexachlorocyclohexane (BHC) were at concentrations lower than their respective Arizona HBGL and EPA Region IX residential PRG guidelines. The PCB Aroclor-1260 was detected at sample locations 26-01 through 26-08 (Figure 2-6) at concentrations above the EPA Region IX residential PRG. Concentrations of Aroclor-1260 at locations 26-01 through 26-05, and 26-08 were at levels above the HBGL (0.18 mg/kg) but less than the EPA Region IX residential PRG (1.4 mg/kg). TPH as diesel was estimated at sample location 26-09 (46,000 mg/kg) above the Arizona UST regulatory guideline for TPH (100 mg/kg).



STARTING DATE: 12/02/94 | DATE LAST REV.: | DRAFT. CHCK. BY:D.AGUILAR | INITIATOR: S.SPARKMAN | DWG. NO.:409881ES.034

DRAWN BY:D.AGUILAR | DRAWN BY: | ENGR. CHCK. BY: S.SPARKMAN | PROJ. MGR.:W.CARTER | PROJ. NO.: 409881

FILENAME: 409881ES.034 13:43:28 Nov. 15, 1995 DAA

LEGEND:

- SOIL SAMPLE LOCATIONS 10/05/93
- FENCE

SCALE

0 10 20 FEET

FIGURE 2-6
SITE LOCATION MAP
FACILITY 766
PRIME BEEF YARD

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A removal action was recommended to excavate the soil northwest of Building 766 and the soils surrounding the concrete pad at Building 766 and sample the soil at both locations.

2.2.1.5 Golf Course Maintenance Area (SS-31)

The Golf Course Maintenance Area is located adjacent to the golf course driving range on the west side of the Base, north and west of E Street (Figure 2-3). The area is used to park, maintain, and refuel mowers, tractors, and other vehicles for the golf course.

The area consists of two aboveground storage tanks (AST) on a concrete pad in the southeast corner of the yard, an area of soil approximately 15 by 5 feet where the ASTs were formerly located to the north, and an area to the east of Building 255 near the entrance gate. One AST contained diesel fuel and one contained unleaded gasoline. Base personnel have verified the former AST location, and observed the relocation of the ASTs from the soil area to the concrete pad at the south end of the yard.

An area of stained soil exists adjacent to the concrete pad area near the location of one of the ASTs. No evidence of spillage exists at the former AST location; however, the surface where ASTs were located is disturbed and ADEQ personnel indicated evidence of a stained area slightly south of the disturbed soil. A potentially stained area (dark soil) to the east of Building 255 near the entrance gate was sampled at a location indicated by ADEQ personnel.

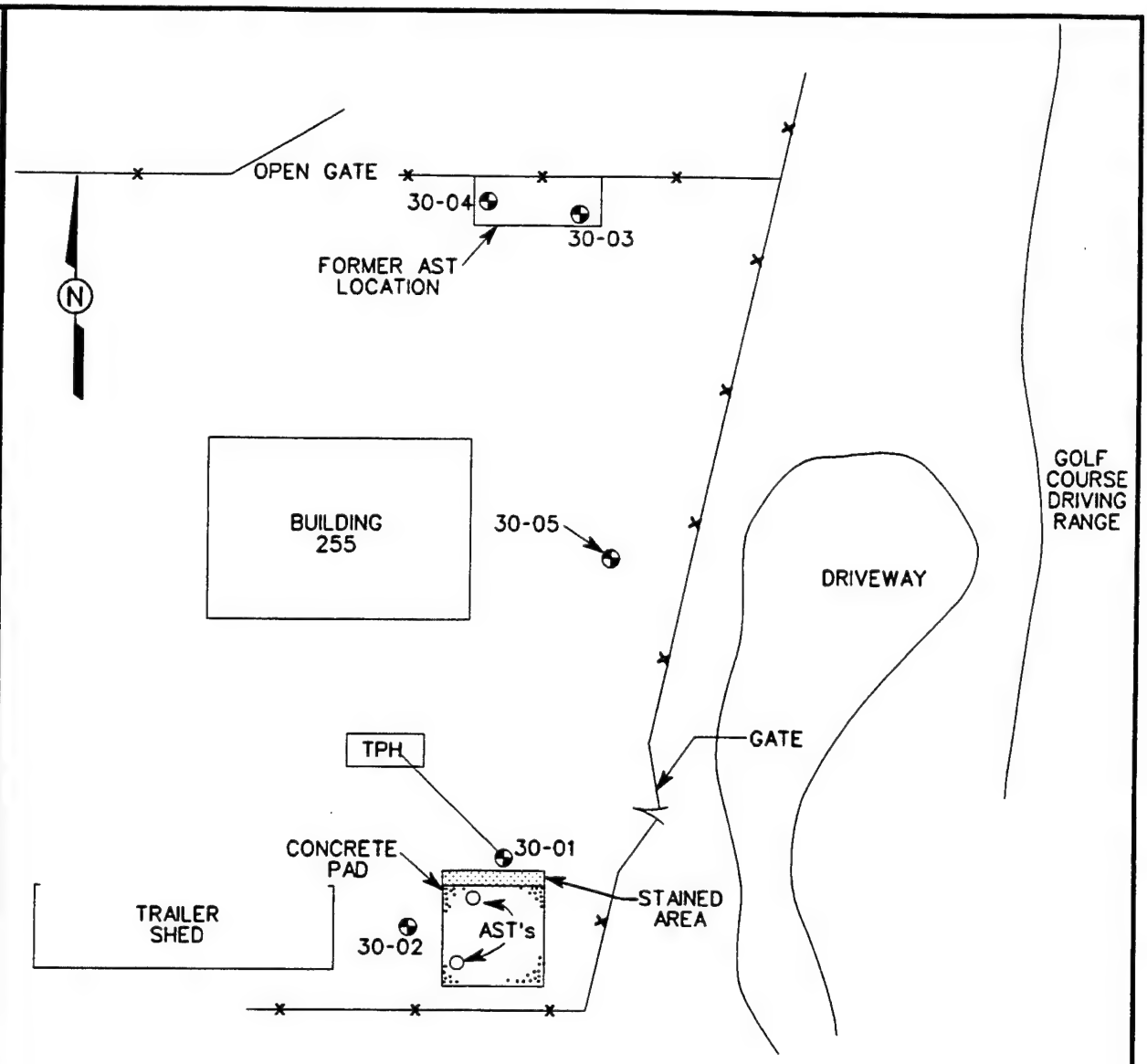
Samples were collected from five locations indicated in Figure 2-7. Samples collected from the current and former AST locations were analyzed for TPH. Samples collected from the potentially stained soils east of Building 255 were analyzed for SVOCs.

TPH was detected at 260 mg/kg at location 30-01 (Figure 2-7), above the Arizona UST regulatory guideline of 100 mg/kg. All other detected analytes (TPH and SVOCs) in samples collected at the Golf Course Maintenance Area were at concentrations below Arizona HBGL and EPA Region IX residential PRG guidelines.

A removal action was recommended to excavate soil located north of the current AST locations and collect soil samples.

2.2.1.6 Building 1070 (SS-32)

This facility, consisting of offices as well as a storage yard behind the building, was constructed in 1987 to house the contractors providing refuse service on Base. The yard is used



STARTING DATE: 12/02/94	DATE LAST REV.:	DRAFT. CHCK. BY:D.AGUILAR	INITIATOR: S.SPARKMAN
DRAWN BY:D.AGUILAR	DRAWN BY:	ENGR. CHCK. BY: S.SPARKMAN	PROJ. MGR.:W.CARTER
			DWG. NO.:409881ES.035
			PROJ. NO.: 409881

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LEGEND:

- SOIL SAMPLE LOCATIONS 11/08/93
- STAINED AREA
- AST ABOVEGROUND STORAGE TANK

SCALE

0 20 40 FEET

FIGURE 2-7
SITE LOCATION MAP
GOLF COURSE MAINTENANCE AREA

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PHOENIX, ARIZONA

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for storage of equipment and vehicles. Some staining was noted in a slightly depressed area in the gravel parking area north of Building 1070. No previous sampling has been performed at this site (Figure 2-8). A removal action was recommended to excavate the gravel and underlying soil where staining was noted.

2.2.1.7 Munitions Incinerator (Facility 1119, SS-34)

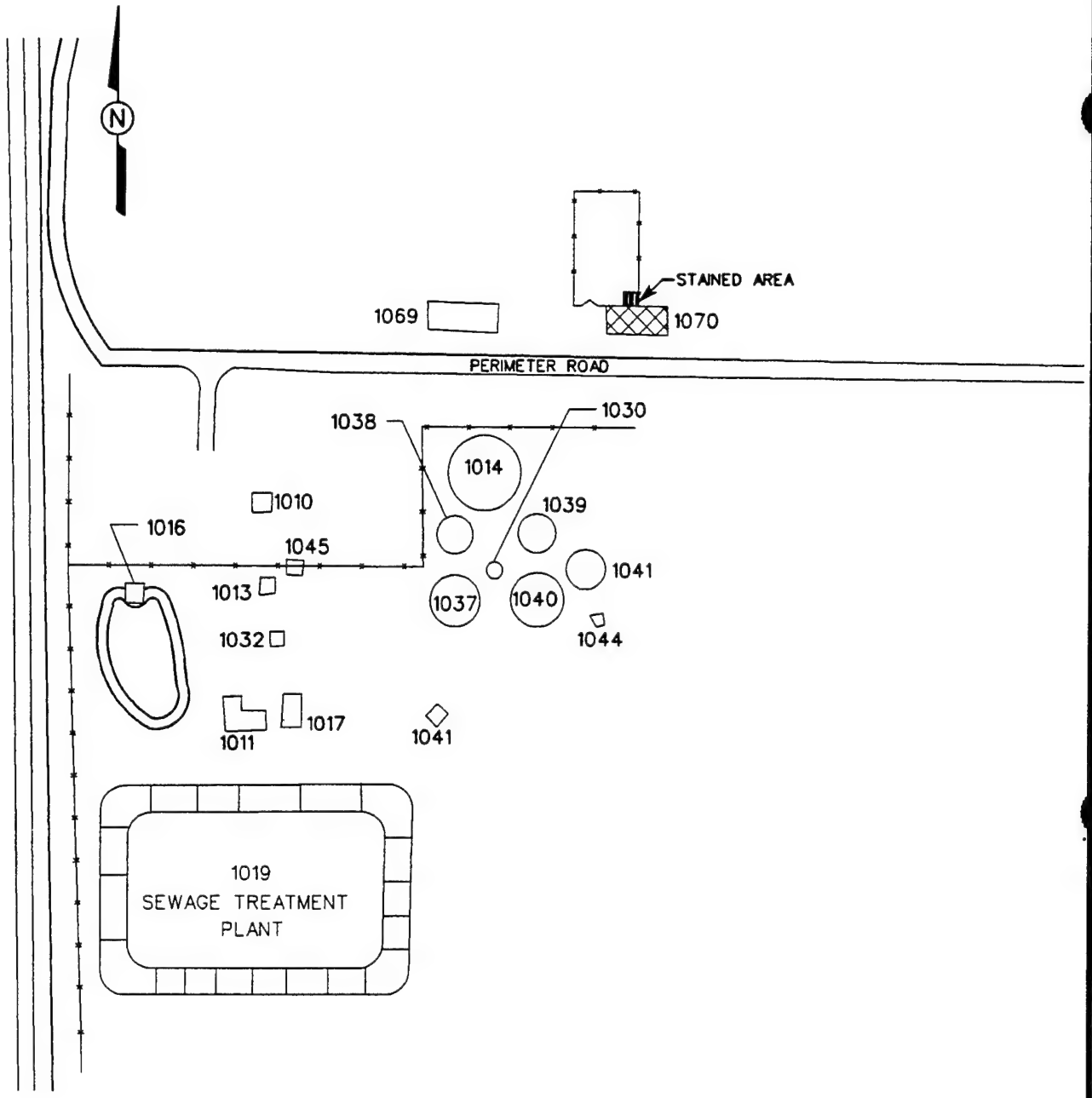
The Munitions Incinerator area is located on the eastern side of the Base, west of Perimeter Road, northeast of Runway 12L-30R, and south of the Concrete Hardfill Area (Figure 2-3). The facility began operating in 1979, but is no longer in use. Visual inspection of the area revealed dark stained soil immediately to the south and east of the incinerator. In addition, an aboveground, 2-inch-diameter fuel line was observed leading from the incinerator to the north, where it disappeared into the ground. Approximately 110 feet north (adjacent to the flagpole) is a small concrete-bermed area with a pipe protruding from the ground in the south end.

Sampling was performed during the E/A (IT, 1994b) to determine if any contamination existed in the soil around the munitions incinerator. Also, the bermed area adjacent to the flagpole was excavated to verify that a UST for fueling the incinerator was not present.

Samples were collected from three locations indicated in Figure 2-9 and were analyzed for PPMs, SVOCs, and TPH.

One SVOC, phenanthrene, was detected in soil samples from this area at an estimated concentration that was below the contract-required detection limit. Acceptable concentrations for phenanthrene are not listed in the Arizona HBGL, and there is no established guideline in the EPA Region IX residential PRG listings.

Analytical results for PPMs from the Munitions Incinerator area were compared to Base-specific background ranges. All of the PPMs were detected at concentrations lower than respective HBGLs and EPA Region IX residential PRGs except for arsenic and beryllium; both these PPMs were within their respective Base-specific background ranges and are not considered contaminants. Arsenic, beryllium, chromium, and nickel were detected at both locations 6-01 and 6-03 (Figure 2-9) at concentrations within or lower than Base-specific background ranges for those PPMs at the Base. Lead was detected twice with one detection at location 6-02 exceeding Base-specific background. Cadmium was detected at location 6-01 at a concentration greater than its Base-specific background range. Copper and zinc were



STARTING DATE: 10-13-95 | DATE LAST REV.: | DRAFT. CHCK. BY: C.TUMLIN | INITIATOR: D.WILLEN | DWG. NO.409881ES.057

DRAWN BY: D.AGUILAR | DRAWN BY: | ENGR. CHCK. BY: D.WILLEN | PROJ. MGR.: W.CARTER | PROJ. NO.:409881

FILENAME: 409881ES.057 15:03:43 Dec. 18, 1995 DLB

LEGEND:

1014 — FACILITY 1014

FENCE

STAINED AREA

SCALE

0 200 400 FEET

FIGURE 2-8
SITE LOCATION MAP
BUILDING 1070

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

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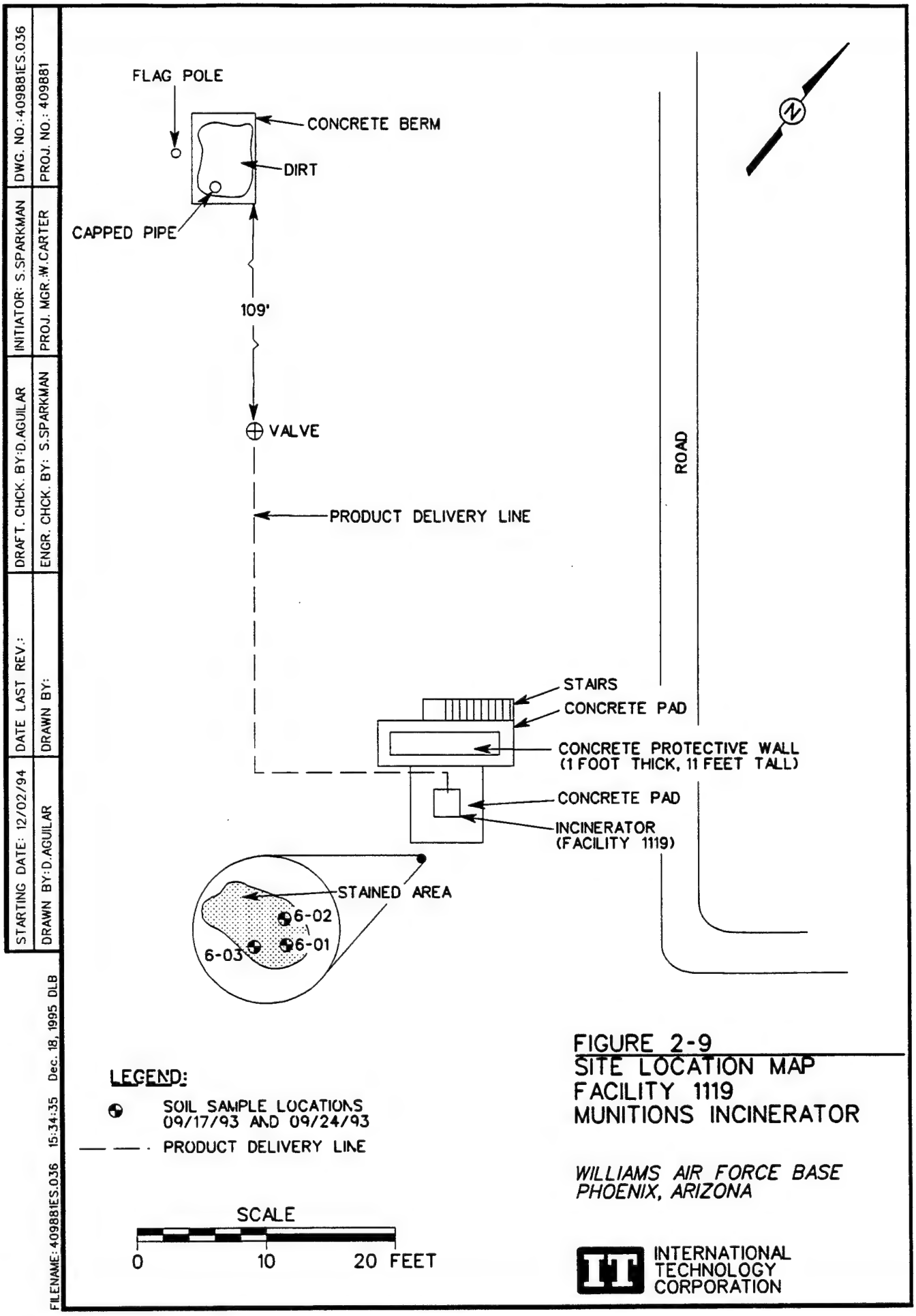

FIGURE 2-9
SITE LOCATION MAP
FACILITY 1119
MUNITIONS INCINERATOR

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

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detected above their Base-specific background ranges at two locations (6-02 and 6-03). It was recommended that the stained soil be removed and soil samples collected.

2.2.1.8 Concrete Hardfill Area (LF-26)

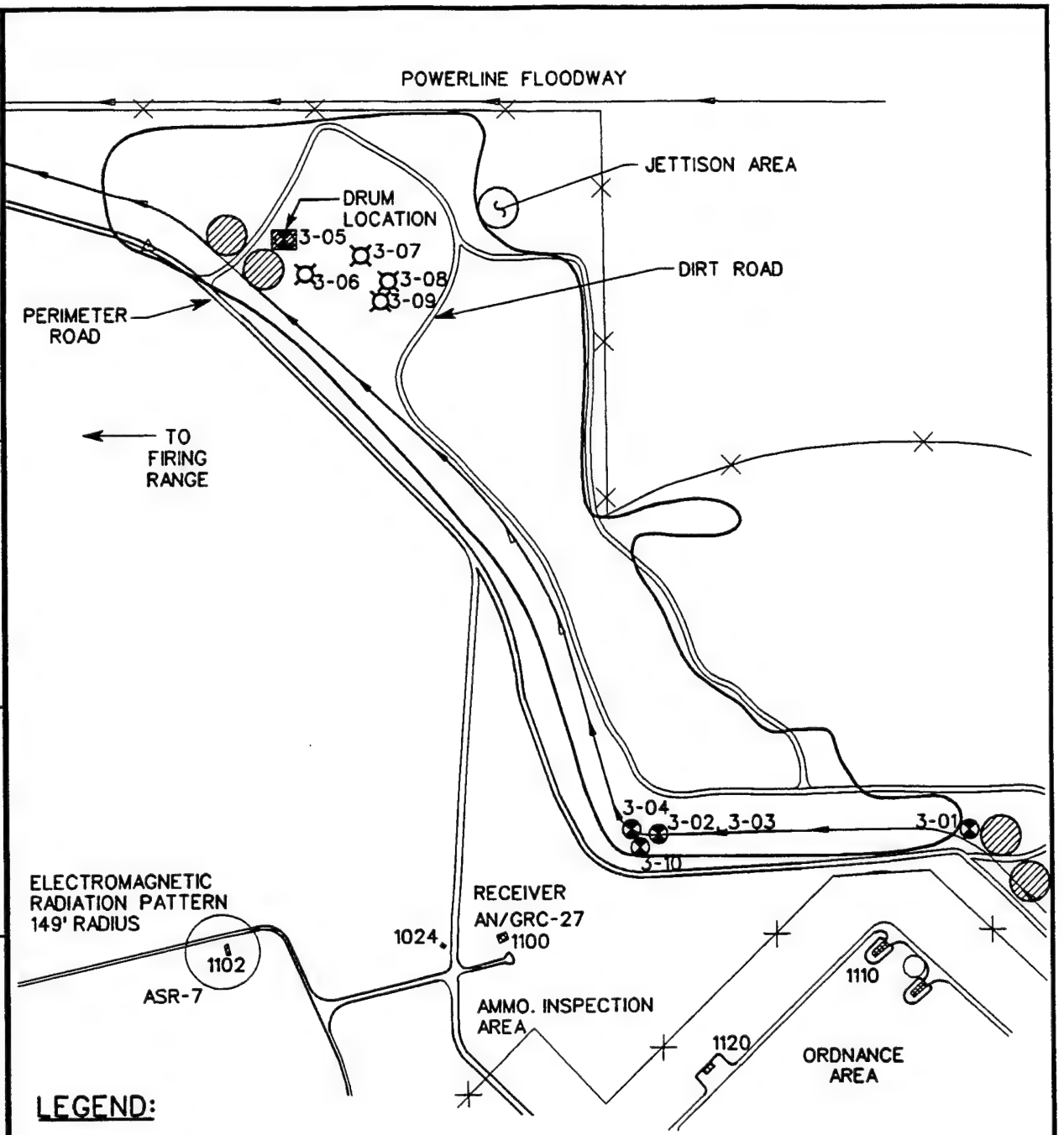
The Concrete Hardfill Area is located on the northeast corner of the Base, northeast of Perimeter Road, and south of the Base fence (Figure 2-1, Figure 2-10). The area was designated for the disposal of concrete from the construction and destruction of runways for many years. Visual inspection of the area during the E/A (IT, 1994b) found debris other than concrete, including vinyl asbestos tile, asbestos concrete pipe, several drums, empty paint cans and roofing tar buckets, and other construction debris. Two soil piles wrapped in plastic consist of material removed from golf course ponds when they were lined. Also, a former Base employee reported seeing drums of unknown content buried in this area.

As indicated in Figure 2-10, a geophysical survey was conducted during the E/A (IT, 1994b). Total field magnetic and EM conductivity data were collected at the site using an EG&G 822-L cesium vapor magnetometer and a Geonics EM-31 DL Terrain Conductivity Meter. The geophysical survey verified that there were no buried drums, contrary to a former Base employee's observation.

Samples were collected from nine locations indicated in Figure 2-10. Soil samples from this area were analyzed for (at a maximum) VOCs, SVOCs, and pesticides/PCB. Samples of the concrete piping and vinyl tiles were collected and analyzed for asbestos fiber content.

Three PAH SVOCs (benzo[a]pyrene, benzo[b]fluoranthene, and dibenzo[a,h]anthracene) detected at location 3-05 (Figure 2-10) exceeded the EPA Region IX residential PRG. Benzo(a)pyrene also exceeded the Arizona HBGL at location 3-05. Dieldrin at location 3-05 exceeded the HBGL and the EPA Region IX residential PRG. All other compounds detected at the Concrete Hardfill Area were less than their respective HBGLs or EPA Region IX residential PRGs.

The investigation disclosed that the asbestos-containing material in the Concrete Hardfill Area is nonfriable. Further investigation into nonfriable asbestos-laden tiles and concrete located within the Concrete Hardfill Area is not required by either federal or Arizona guidance. These materials do not appear to pose an unacceptable risk to human health or the environment, because there is no known pathway for exposure to, or risk associated with, nonfriable asbestos in limited and dispersed quantities over a large, outdoor area. However, it was



LEGEND:

- FENCE
- 1024 BUILDING NUMBER
- DRAINAGE
- SOIL SAMPLE LOCATIONS 11/09/93, 11/10/93, AND 11/19/93
- PREVIOUS STUDY ASBESTOS SAMPLE LOCATIONS
- PREVIOUS STUDY GEOPHYSICAL SURVEY AREAS

SCALE

0 600 1200 FEET

FIGURE 2-10
SAMPLE LOCATION MAP CONCRETE HARDFILL AREA

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DWG. NO.: 409881ES.140 | PROJ. NO.: 409881
INITIATOR: D. WILLEN | PROJ. MGR.: W. CARTER
DRAFT. CHCK. BY: C. TUMLIN | ENGR. CHCK. BY: D. WILLEN
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 11/6/95 | DRAWN BY: K. WOOD

409881ES.140 15:46:21 Dec. 18, 1995 DLB

recommended that the Concrete Hardfill Area be included under OU-4 for further investigation upon completion of the removal action in OU-5 to ensure there is no human health hazard.

It was recommended that the drum and surrounding soils and concrete be removed and soil samples collected.

This drum removal area under OU-5 has now been designated as the Concrete Hardfill Drum Removal Area to avoid confusion with the remainder of the Concrete Hardfill Area, which is being investigated under OU-4.

2.2.1.9 Sewage Sludge Stockpile Area (Area 28)

The Sewage Sludge Stockpile area is located to the northeast of the golf course (Figure 2-3) on Perimeter Road. This area was used for stockpiling of treated sludge from the WWTP from 1979 until late 1992. Visual inspection indicated that the sewage sludge piles have been graded level with the ground surface to an approximate thickness of 1 to 7 inches.

The work was previously completed in September 1993 and reported in the Final E/A Report (IT, 1994b). The sampling approach is discussed in Section 3.12.

2.2.2 Geology

Because of the uniform nature of the Basewide geology and the fact that the eight sites included in the OU-5 RI are in relative close proximity, the site-specific geology is the same as the discussion previously presented in Section 2.1.3.

2.2.3 Groundwater

Because the eight sites included in the OU-5 RI are in relatively close proximity, the site-specific groundwater is the same as the discussion previously presented in Section 2.1.4. Based on the nature and concentrations of contaminants detected at the OU-5 sites, there is no reason to suspect impact to groundwater. No monitoring wells are planned to be installed at any of the OU-5 sites.

2.2.4 Surface Water

The topography of the Base is essentially flat with surface water draining to ditches that drain the Base (Section 2.1.5). A drainage ditch that could collect and convey contaminants passes directly adjacent to the Concrete Hardfill Area.

2.2.5 Air

Because of the relatively small flat area of the Base and proximity of the eight sites included in the OU-5 RI, the site-specific discussion on air is the same as the discussion previously presented in Section 2.1.2.

2.2.6 Biology

Because the Base is small and the eight sites included in the OU-5 RI are in such close proximity, the site-specific discussion on the biology is the same as the discussion previously presented in Section 2.1.7.

2.2.7 Demographics

Because the Base is small and the eight sites included in the OU-5 RI are in such close proximity, the site-specific discussion on the demographics is the same as the discussion previously presented in Section 2.1.6.

3.0 Remedial Investigation/Removal Tasks

Field activities initiated in July 1995 included excavation, disposal, and soil sampling. Samples were collected in decontaminated brass sleeves utilizing a slam bar in accordance with the approved final FSP (IT, 1995b). Waste profile samples were collected with a stainless-steel trowel.

3.1 Site Reconnaissance and Preparation Procedures

Before starting field work at the OU-5 sites, a site reconnaissance was performed to meet the following objectives:

- Obtain a Base excavation clearance.
- Verify site access for excavation activities.
- Verify utility locations (utilities identified by representatives of the Base).
- Confirm excavation locations.
- Collect any necessary supplemental information to determine the safety requirements for personnel initially and subsequently entering the site.

3.2 Excavation, Confirmatory Sampling, and Restoration Procedures

The OU-5 site locations and previous study sampling locations are discussed in Chapter 2.0. Areas to be excavated were marked with barrier tape and removal of contaminated soil was completed by using a backhoe. Excavated soil was placed in roll-off bins for storage until disposal. Confirmatory samples were collected from the bottom and/or limits of an excavation to determine whether contaminants remained.

Excavation at six of the OU-5 sites was performed to remove areas of suspected contamination previously identified in the E/A report, facilities assessment report, or during other investigations. Confirmatory soil samples were collected in accordance with Section 4.1 of the final FSP (IT, 1995b) to verify that contaminants greater than the Arizona HBGL or EPA Region IX residential PRGs had been removed and properly disposed.

Excavation was done in 6- to 12-inch cuts until there was no visual evidence of contamination. The presence of contamination was based on visual evidence of stained soil and photoionization detector (PID) readings. During excavation and removal of VOC-contami-

nated soil, field VOC readings were taken and recorded using a PID (e.g., HNu) and headspace methods to approximate the VOC levels in soil. These measurements were made periodically as excavation proceeded. After the contaminated soils were removed, undisturbed soil samples were collected with brass sleeves driven with a slam bar sampler from the bottom and/or limits of the excavation for analyses to ensure that contamination had been removed. The results of the analyses were used to determine whether the sites required further investigation by comparing results to EPA Region IX PRGs and conducting a screening level risk analysis (discussed in Chapters 5.0 and 6.0). The dimensions of each excavation were measured and recorded.

Waste profile samples were collected to determine the final disposition of the excavated material. The excavated material was temporarily stored in roll-off bins in a staging area until analytical results from the waste profile samples were received. The soils removed from the Prime Beef Yard were placed in one roll-off bin, and the excavated material from the remaining OU-5 sites was placed in the remaining roll-off bins. One composite waste profile sample was collected from each roll-off bin, using a decontaminated stainless-steel trowel. After the analytical results were received, all the material was sent to the Resource Processing Land Corporation, Phoenix, Arizona for thermal destruction.

After the excavation and confirmatory sampling was completed, each site was restored to its original condition. The excavation was backfilled with clean fill and compacted using the bucket of a steam-cleaned backhoe. Clean fill material was obtained from leftover borrow soil from the Landfill (LF-04) remedial action (capping). The fill material for excavated areas had been verified through testing to contain no contaminants that would pose a hazard to human health or the environment. Testing had been previously conducted as part of the OU-1 removal action at LF-04 (IT, 1995e). Compaction and restoration of disturbed sites followed the requirements of the final FSP (IT, 1995b). Corners of the backfilled excavation and sampling locations were marked with wooden stakes. Decontamination fluids generated from cleaning sample tools and the backhoe were collected and transported to the investigative waste facility, where they were disposed.

Table 3-1 provides a summary of the soil sampling and parameters analyzed at each OU-5 site, while Table 3-2 provides the sampling and QC detailed requirements. The following sections describe excavation activities at the selected OU-5 sites.

Table 3-1

Removal Action Work Summary
Operable Unit 5
Williams Air Force Base, Arizona

Site No.	Description	Field Activities	Number of Samples	Analytical Parameters[a]
Field Samples				
ST-25	Airfield USTs	Remove drum, collect soil samples from below drum, and backfill with clean soil.	3	TPH, VOCs, SVOCs
WP-27	Paint Shop Leach Field	Excavate leach field, collect soil samples from bottom of excavation, and backfill with clean soil.	6	SVOCs, TPH, PPMs
SS-29	Prime Beef Yard	Excavate stained soil northwest of Bldg. 766 and around pad at Bldg. 766. Collect soil samples from bottom of excavation northwest of Bldg. 766 and the west and south sides of Bldg. 766, and backfill excavations with clean soil.	14[b]	TPH, VOCs, SVOCs, PPM, Pesticides/PCBs
SS-31	Golf Course Maintenance Area	Excavate soil north of current AST locations, collect soil samples from bottom of excavation, and backfill with clean soil.	4	TPH, SVOCs
SS-32	Building 1070	Remove gravel and underlying soil north of Bldg. 1070, collect soil samples, and backfill with clean soil.	0[c]	--
SS-34	Munitions Incinerator Facility 1119	Remove stained soil from area south of incinerator, collect soil samples, and backfill with clean soil.	8	Pesticides/PCBs, TPH, SVOCs, PPMs

Table 3-1

Removal Action Work Summary
Operable Unit 5
Williams Air Force Base, Arizona

Site No.	Description	Field Activities	Number of Samples	Analytical Parameters[a]
LF-26	Concrete Hardfill Drum Removal Area	Remove drum and surrounding soil, collect soil samples from bottom of excavation, and fill with clean soil.	2	SVOCs, Pesticides/PCBs
Area 28	Sewage Sludge Stockpile Area	Take soil samples of sludge and soil.	3	SVOC, Metals, Pesticides/PCBs
Waste Profile Samples				
--	Excavated Material	Collect composite soil samples from each of nine roll-off bins containing site excavated material.	9[d]	TCLP VOCs, Pesticides, RCRA Metals

[a]TPH - Total petroleum hydrocarbons as diesel or JP-4 (Modified 8015)
SVOC - Semivolatile organic compounds - Contract Laboratory Program (CLP) Method
Pesticides/PCB - pesticides/polychlorinated biphenyls (CLP)
PPM - Priority pollutant metals (CLP)
TCLP - Toxicity characteristic leaching procedure
VOC - Volatile organic compounds (CLP)
[b]Two of these samples were collected adjacent to the concrete pad. The third sample was collected north of the pad and was not analyzed for pesticides/PCBs.
[c]Two samples were planned to be taken and analyzed for TPH, VOCs, SVOCs, and total lead, but a decision made by Technical Working Group (TWG) members on July 19, 1995 indicated no removal action was necessary at this site due to an inability to identify a stained area.
[d]A total of nine waste profile samples were collected from the excavated material: one sample per roll-off bin.

Table 3-2

Analytical Samples[a]
Operable Unit 5
Williams Air Force Base, Arizona

Parameters	Analytical Method	Matrix	Number of Field Samples	Field Duplicate (10%)	MS (5%)	MSD (5%)	Field Blank (1/method)	Equip Rinsate (10%)	Trip Blank (1/cooler)
Airfield USTs (ST-25)									
TPH[b] as JP-4	Modified 8015	Soil	1	1	1	1	1	1	0
VOCs[c]	CLP[d]	Soil	1	1	1	1	1	1	1
SVOCs[e]	CLP	Soil	1	1	1	1	1	1	0
Paint Shop Leach Field (WP-27)									
SVOCs	CLP	Soil	2	0	0	0	0	0	0
TPH as diesel	Modified 8015	Soil	2	0	0	0	0	0	0
PPM[f]	CLP	Soil	2	1	1	1	1	1	0
Prime Beef Yard (SS-29)									
TPH as diesel	Modified 8015	Soil	3	1	1	1	1	1	0
VOCs	CLP	Soil	3	0	0	0	0	0	1
SVOCs	CLP	Soil	3	0	0	0	0	0	0
PPM[e]	CLP	Soil	3	0	0	0	0	0	0
Pesticides/PCBs[g]	CLP	Soil	2	0	0	0	0	0	0
Golf Course Maintenance Area (SS-31)									
TPH as diesel	Modified 8015	Soil	2	0	0	0	0	0	0
SVOCs	CLP	Soil	2	0	0	0	0	0	0

Table 3-2

Analytical Samples[a]
Operable Unit 5
Williams Air Force Base, Arizona

Parameters	Analytical Method	Matrix	Number of Field Samples	Field Duplicate (10%)	MS (5%)	MSD (5%)	Field Blank (1/method)	Equip Rinsate (10%)	Trip Blank (1/cooler)
Munitions Incinerator (Facility 1119, SS-34)									
Pesticides/PCBs	CLP	Soil	2	0	0	0	0	0	0
PPM	CLP	Soil	2	0	0	0	0	0	0
SVOCs	CLP	Soil	2	0	0	0	0	0	0
TPH as diesel	Modified 8015	Soil	2	0	0	0	0	0	0
Concrete Hardfill Drum Removal Area (LF-26)									
SVOCs	CLP	Soil	1	0	0	0	0	0	0
Pesticides/PCBs	CLP	Soil	1	1	1	1	1	1	0
Totals			37	6	6	6	6	6	2

[a]This table does not include the 9 waste profile samples that were collected from the excavated material.
[b]TPH - Total petroleum hydrocarbons
[c]VOCs - Volatile organic compounds
[d]CLP - Contract Laboratory Program
[e]SVOC - Semivolatile organic compounds
[f]PPM - Priority pollutant metals
[g]Pesticides/PCBs - Pesticides/polychlorinated biphenyls

3.3 Airfield USTs (ST-25)

The Airfield UST location was not recommended for further investigation in the E/A report (IT, 1994a) because the absence of a UST was confirmed by the geophysical survey. However, it was recommended that the 55-gallon drum be removed, and confirmatory soil samples from underneath the drum be collected and analyzed to verify the removal of contaminants (Figure 3-1).

The removal of the drum and contaminated soil was completed using a decontaminated backhoe. An area approximately 3 feet by 3 feet was excavated to a depth of 45 inches. The top of the drum was near the surface and the bottom of the drum was 35 inches below ground surface (bgs). The bottom of the drum had six to eight rusted holes varying from 1 to 2 inches in diameter. The drum contents were dark brown soil and rounded gravel. The drum appeared to be a component of a seepage pit, but there was no sign of an underlying storm drain line.

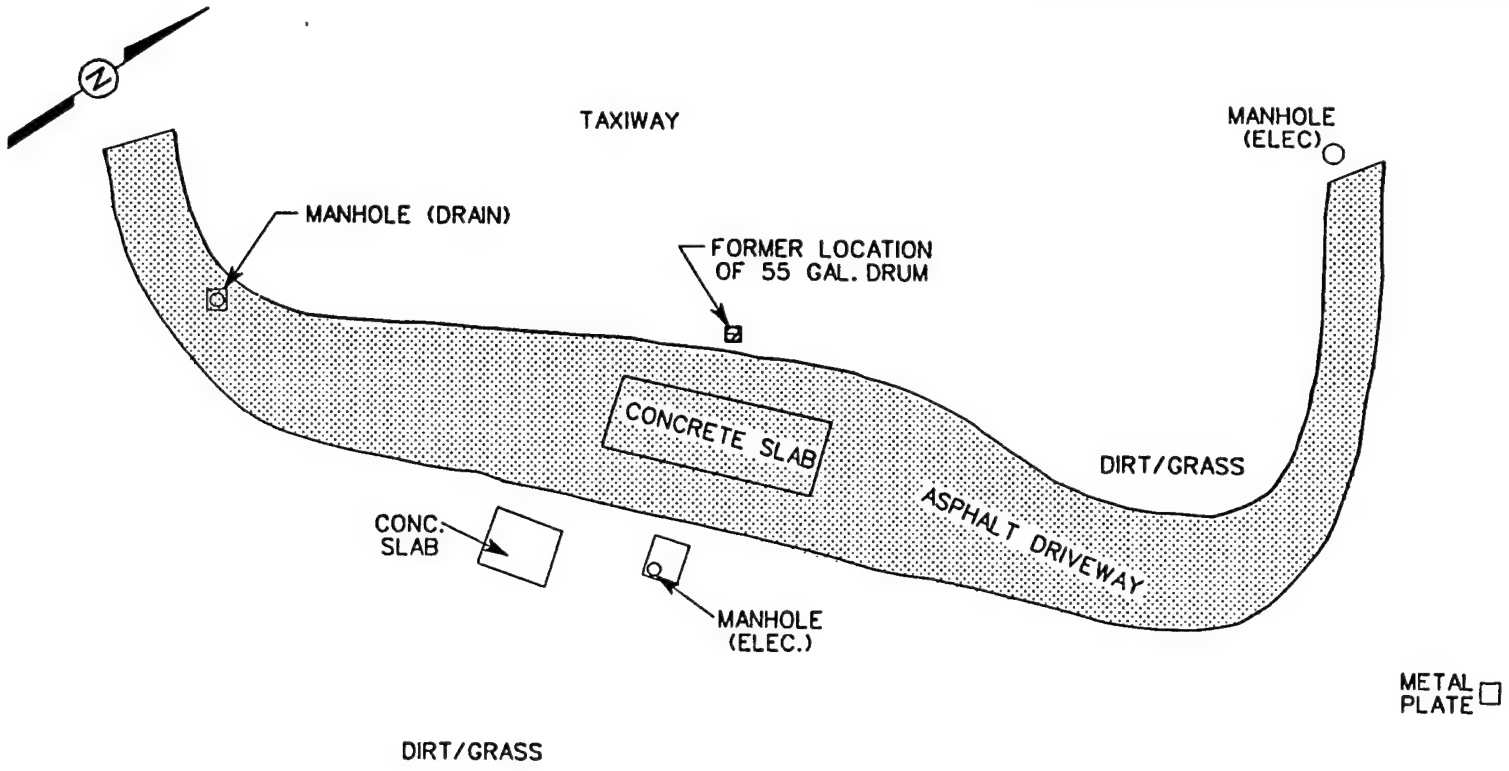
Two samples (D2001 and D2002) were collected from the bottom of the excavation at 45 inches bgs and analyzed for TPH as jet petroleum grade 4 (JP-4) by Modified 8015 for VOCs by CLP, and for SVOCs by CLP. TPH, VOC, and SVOC analyses were performed to determine whether contaminants remained at the site after excavation. The excavation was backfilled with clean soil and stakes were used to mark the sample locations and the excavation limits.

Sample analyses and findings are discussed in Chapter 4.0.

3.4 Paint Shop Leach Field (WP-27)

The field activity included the excavation of the leach field and the collection of three soil confirmatory samples from the bottom of the excavated area.

The removal of the contaminated soil was completed using a decontaminated backhoe. The area was marked with barrier tape and an area 14 by 30 feet was excavated to a depth of approximately 4.5 feet (Figure 3-2). The area excavated included the removal of a remaining section of drain pipe, gravel, and plastic sheeting not removed during the previous excavation activities described in Section 2.2.1.2. Dried latex paint was abundant in the vicinity of the drain pipe.



LEGEND:

DRUM EXCAVATION AREA
(3 FEET X 3 FEET). EXCAVATED TO 45" BGS.
CONFIRMATION SAMPLES D2001 & D2002
COLLECTED FROM BOTTOM OF EXCAVATION.

SCALE

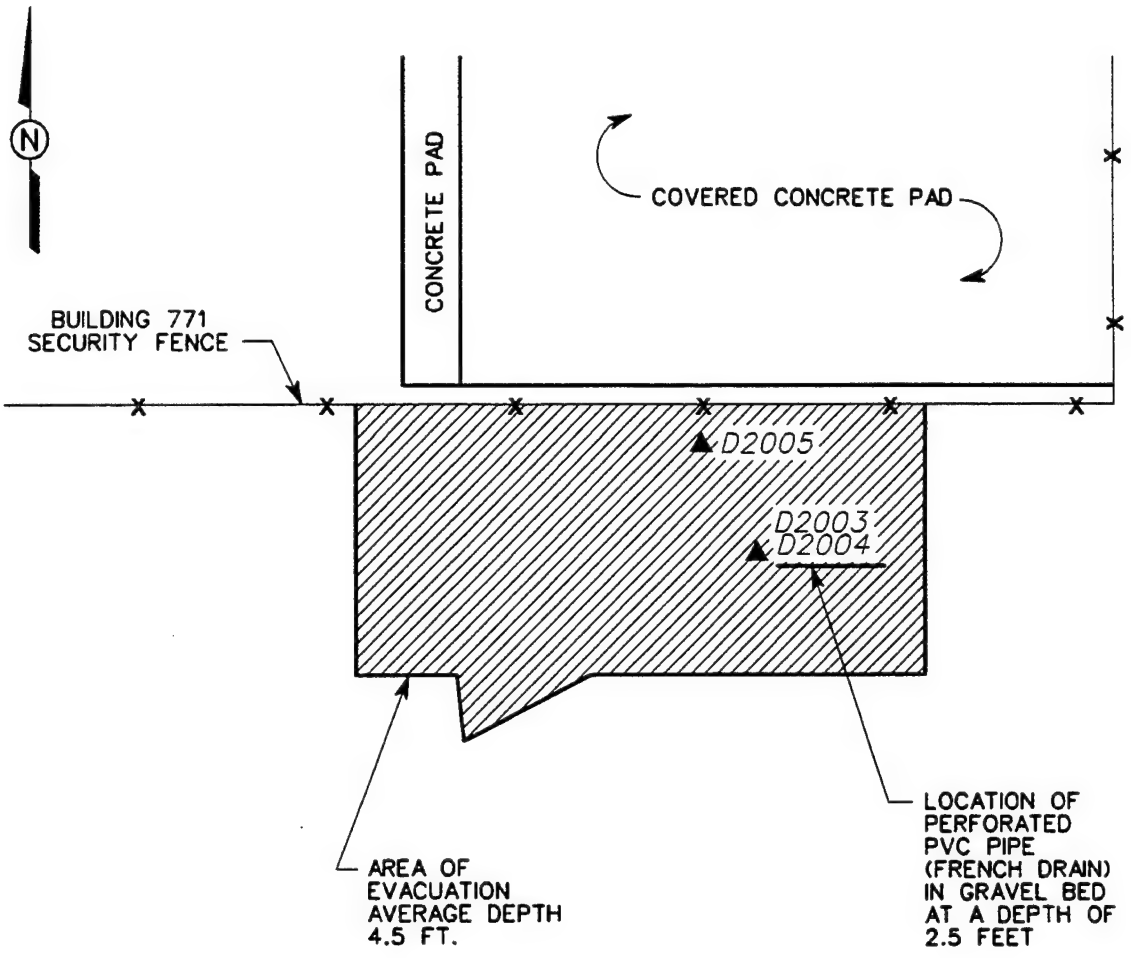
0 80 160 FEET

FIGURE 3-1
SOIL REMOVAL AND SAMPLE LOCATIONS AIRFIELD USTs OPERABLE UNIT 5

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 01/06/95	DATE LAST REV.:	DRAFT. CHCK. BY: D.AGUILAR	INITIATOR: S.SPARKMAN
DRAWN BY: D.AGUILAR	DRAWN BY:	ENGR. CHCK. BY: S.SPARKMAN	PROJ. MGR.: W.CARTER
FILENAME: 409881ES.095 1:34:24 Nov. 15, 1995 KHB			DWG. NO.:409881ES.095 PROJ. NO.: 409881



STARTING DATE: 01/06/95 | DATE LAST REV.: | DRAFT. CHCK. BY:D.AGUILAR | INITIATOR: S.SPARKMAN | DWG. NO.:409881ES.096

DRAWN BY:D.AGUILAR | DRAWN BY: | ENGR. CHCK. BY: S.SPARKMAN | PROJ. MGR.:W.CARTER | PROJ. NO.: 409881

FILENAME: 409881ES.096 15:51:13 Dec. 18, 1995 DLB

LEGEND:

▲ SOIL SAMPLE LOCATIONS. D2005 COLLECTED AT 60" BGS; D2003 AND D2004 COLLECTED AT 55" BGS

—x— FENCE

AREA OF EXCAVATION

SCALE

0 10 20 FEET

FIGURE 3-2

SOIL REMOVAL AND SAMPLE LOCATIONS FORMER PAINT SHOP LEACH FIELD, BLDG. 771

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

Three soil samples were collected: D2003 and D2004 at 55 inches bgs and D2005 at 60 inches bgs. The samples were analyzed for SVOCs by CLP, for TPH as diesel by Modified 8015, and for PPM by CLP to verify the absence of contamination. The backhoe was decontaminated, clean fill was placed in the excavation and compacted, and stakes were used to identify the sample locations and excavation limits. Sample analyses and results are discussed in Chapter 4.0.

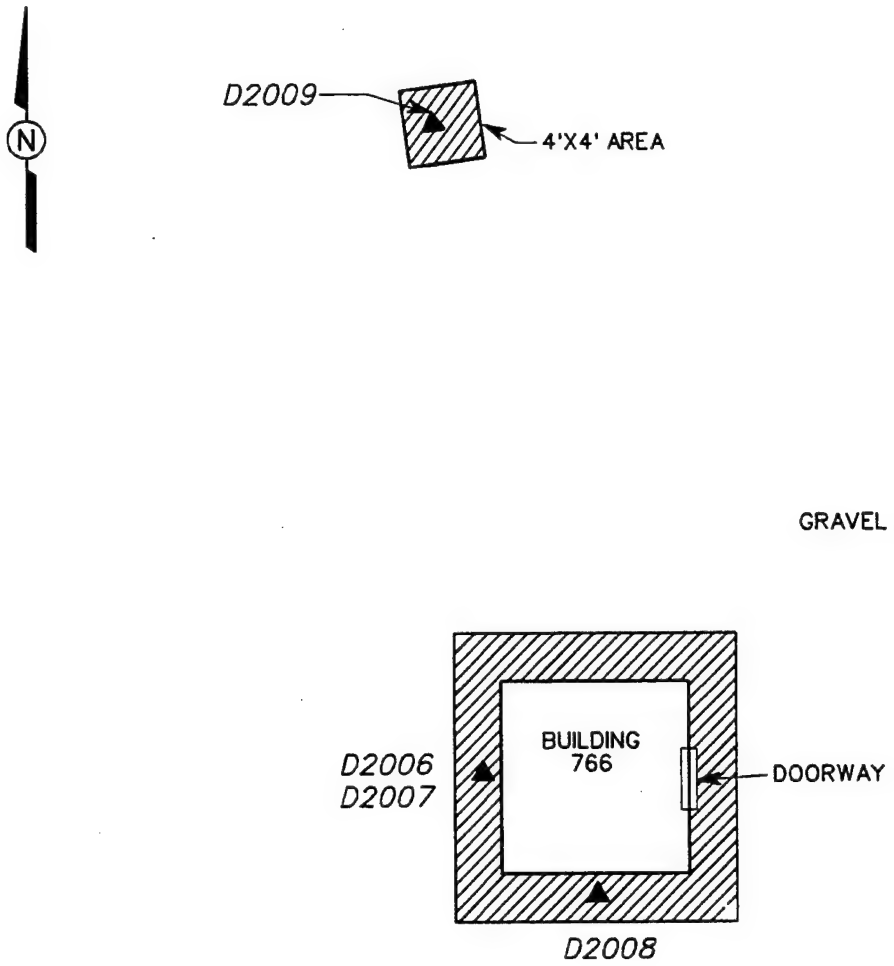
3.5 Sewage Sludge Trenches (DP-28)

No action was required under the OU-5 removal actions because the Sewage Sludge Trenches were capped as part of the final remedy for the Landfill (LF-04) under OU-1. This action was taken because of the close proximity and common contamination (dieldrin) at both the landfill site and Sewage Sludge Trenches (IT, 1995e).

3.6 Prime Beef Yard (SS-29)

The removal action included the excavation of the stained soil approximately 18 feet northwest of Building 766 and excavation of soils surrounding the concrete pad at Building 766. The contaminated soil was removed using a decontaminated backhoe. The first area to be excavated was northwest of the building; the area measured approximately 4 by 4 feet, and was excavated to a depth of approximately 3 feet (Figure 3-3). One confirmatory soil sample (D2009) was collected from the bottom of the excavation at 3 feet bgs and analyzed for TPH as diesel by Modified 8015, and VOCs, SVOCs, and PPM by CLP to verify the absence of contamination. The second area excavated was a 30-inch-wide section of soil from all four sides of the concrete pad to a depth of 2 feet around Building 766. All excavated soil from the Prime Beef Yard removal action was placed in one roll-off bin. Three undisturbed, confirmatory soil samples (D2006 to 2008) were collected from the excavation area around Building 766 and analyzed for TPH as diesel by Modified 8015, and for VOCs, SVOCs, PPM, and pesticides/PCBs by CLP to verify the absence of contamination. Also, a composite waste profile sample was collected from the excavated material in the rolloff bin. Soil analyses and results are discussed in Chapter 4.0.

The backhoe bucket was decontaminated and clean fill was placed in the excavations and compacted with the backhoe bucket. Stakes were driven into the soil to mark the sample locations and excavation limits.



STARTING DATE: 01/06/95	DATE LAST REV.:	DRAFT. CHCK. BY:D.AGUILAR	INITIATOR: S.SPARKMAN
DRAWN BY:D.AGUILAR	DRAWN BY:	ENGR. CHCK. BY: S.SPARKMAN	PROJ. MGR.:W.CARTER
			DWG. NO.:409881ES.097
			PROJ. NO.: 409881

FILENAME: 409881ES.097 13:01:25 Jan. 22, 1996 KLW

LEGEND:

- ▲ SOIL SAMPLE LOCATIONS: D2009 COLLECTED AT 3' BGS; D2006-2008 COLLECTED AT 2' BGS
- —x— FENCE
- AREAS EXCAVATED TO 2.0 FEET

SCALE

0 10 20 FEET

FIGURE 3-3

SOIL REMOVAL AND SAMPLE LOCATIONS FACILITY 766 PRIME BEEF YARD

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

IT INTERNATIONAL TECHNOLOGY CORPORATION

3.7 Golf Course Maintenance Area (SS-31)

The removal action included the excavation of contaminated soil located north of the current AST locations and the collection of two confirmatory soil samples from the bottom of the excavated area.

The area was marked with barrier tape and the contaminated soil was removed using a decontaminated backhoe. An area approximately 2.5 by 12 feet was excavated to a depth of approximately 3 feet (Figure 3-4).

Two undisturbed, confirmatory soil samples (D2010 and D2011) were collected at 3.5 feet bgs and analyzed for TPH as diesel by Modified 8015 and for SVOCs by CLP to verify the absence of contamination. Sample analyses and results are discussed in Chapter 4.0.

The backhoe bucket was decontaminated and clean fill was placed in the excavation and compacted. Stakes were driven into the ground to mark the sample locations and the limits of the excavation.

3.8 Building 1070 (SS-32)

The removal action in the OU-5 work plan required removing the gravel and underlying soil in an area near Building 1070. A soil staining was previously observed in the gravel parking area (Figure 3-5). Collection of two samples was planned for this site. There were no previously reported activities involving the use, handling, or disposal at or near this facility. The stained area was presumed to be oil drippings from a vehicle or other equipment.

However, during the site inspection, prior to excavation, no staining was observed. The stain was probably attributed to a rainfall event collecting at a low spot in the area prior to the site observation and once the rain soaked into the ground or evaporated there was no stain. On July 19, 1995, during a TWG meeting, the TWG members inspected the site and could not detect any staining nor evidence of the cited potentially contaminated area. There was agreement of all members that no action was necessary. This agreement was formalized in a field variance. Thus, no excavation/sampling was required or done.

3.9 Munitions Incinerator (Facility 1119, SS-34)

The removal action included the excavation of soil from a dark stained area located immediately to the south of the incinerator (Figure 3-6) and the collection of two undisturbed soil samples from the bottom of the excavated area.

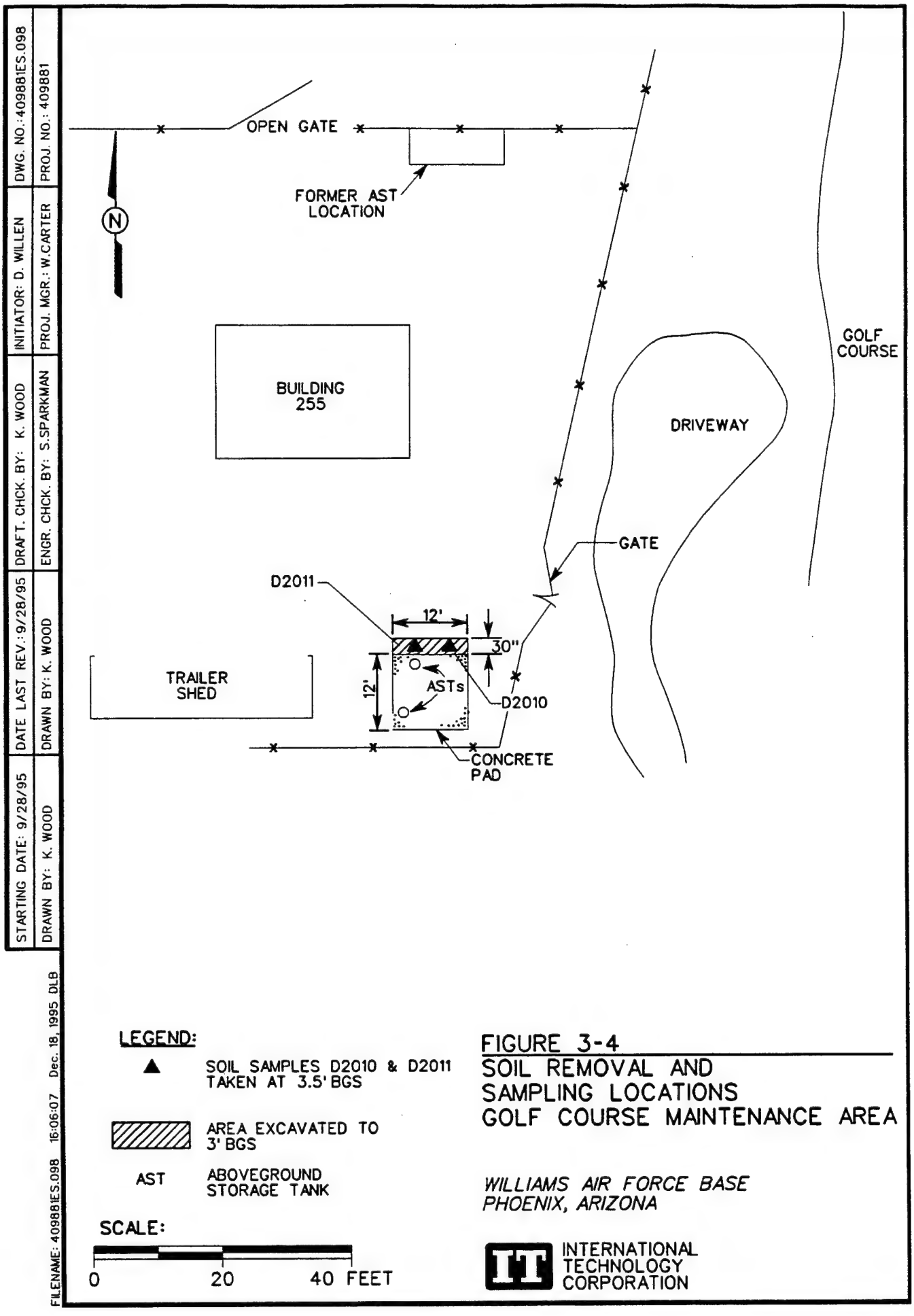
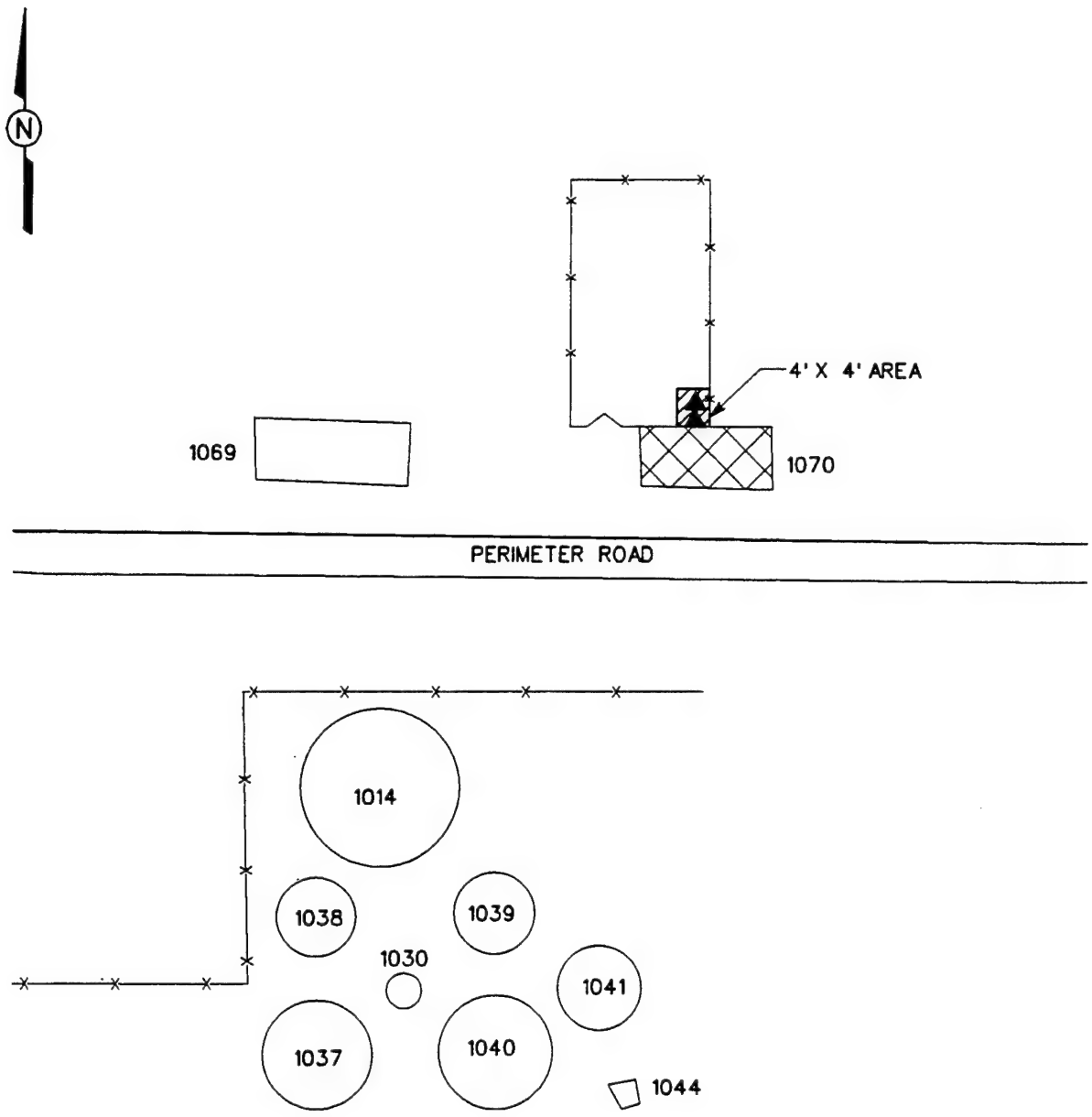


FIGURE 3-4
SOIL REMOVAL AND SAMPLING LOCATIONS
GOLF COURSE MAINTENANCE AREA

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION



LEGEND:

1014 — FACILITY 1014

FENCE

PROPOSED SOIL EXCAVATION AREA (2 FT. DEEP)

PROPOSED SOIL SAMPLE LOCATIONS

SCALE

0 100 200 FEET

FIGURE 3-5
PROPOSED SOIL REMOVAL AND SAMPLING LOCATIONS
BUILDING 1070

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 10-16-95	DATE LAST REV.:	DRAFT. CHCK. BY: C.TUMLIN	INITIATOR: D.WILLEN
DRAWN BY: D.AGUILAR	DRAWN BY:	ENGR. CHCK. BY: D.WILLEN	PROJ. MGR.: W.CARTER

DWG. NO.: 409881ES.100
PROJ. NO.: 409881

FILENAME: 409881ES.100 16:21:23 Dec. 18, 1995 DLB

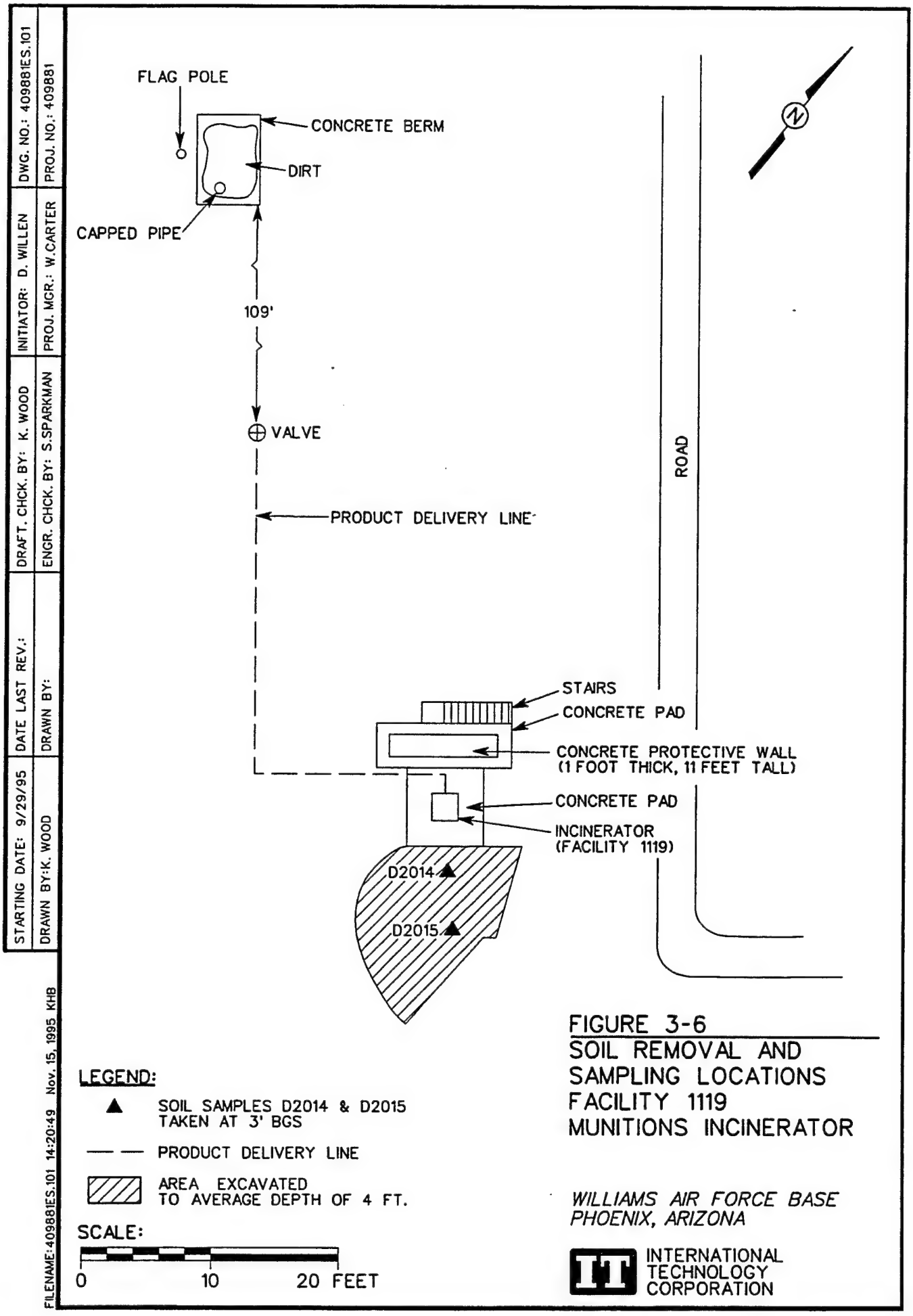


FIGURE 3-6
SOIL REMOVAL AND SAMPLING LOCATIONS
FACILITY 1119
MUNITIONS INCINERATOR

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

The area was marked with barrier tape and approximately an 80-square-foot area of contaminated soil was removed to a depth of approximately 4 feet using a decontaminated backhoe. The dark soil stain was irregular on the surface soil and was very limited in extent beneath the surface soil.

Two confirmatory soil samples were collected (D2014 and D2015) at 3 feet bgs and analyzed for pesticides/PCBs, PPM, and, SVOCs by CLP, and for TPH as diesel by Modified 8015 to verify the absence of contamination.

The backhoe bucket was decontaminated and clean fill was placed in the excavation and compacted with the backhoe bucket. The sample locations and excavation limits were marked using stakes. Sample analyses and results are discussed in Chapter 4.0.

3.10 Concrete Hardfill Drum Removal Area (LF-26)

This area is referred to as the Concrete Hardfill Drum Removal Area to avoid confusion with the remainder of the Concrete Hardfill Area, which is being investigated under OU-4 activities. The removal action included the localized removal of the 55-gallon drum and surrounding soils and concrete located in the surface drainage ditch and the collection of confirmatory soil samples from the bottom of the excavated area.

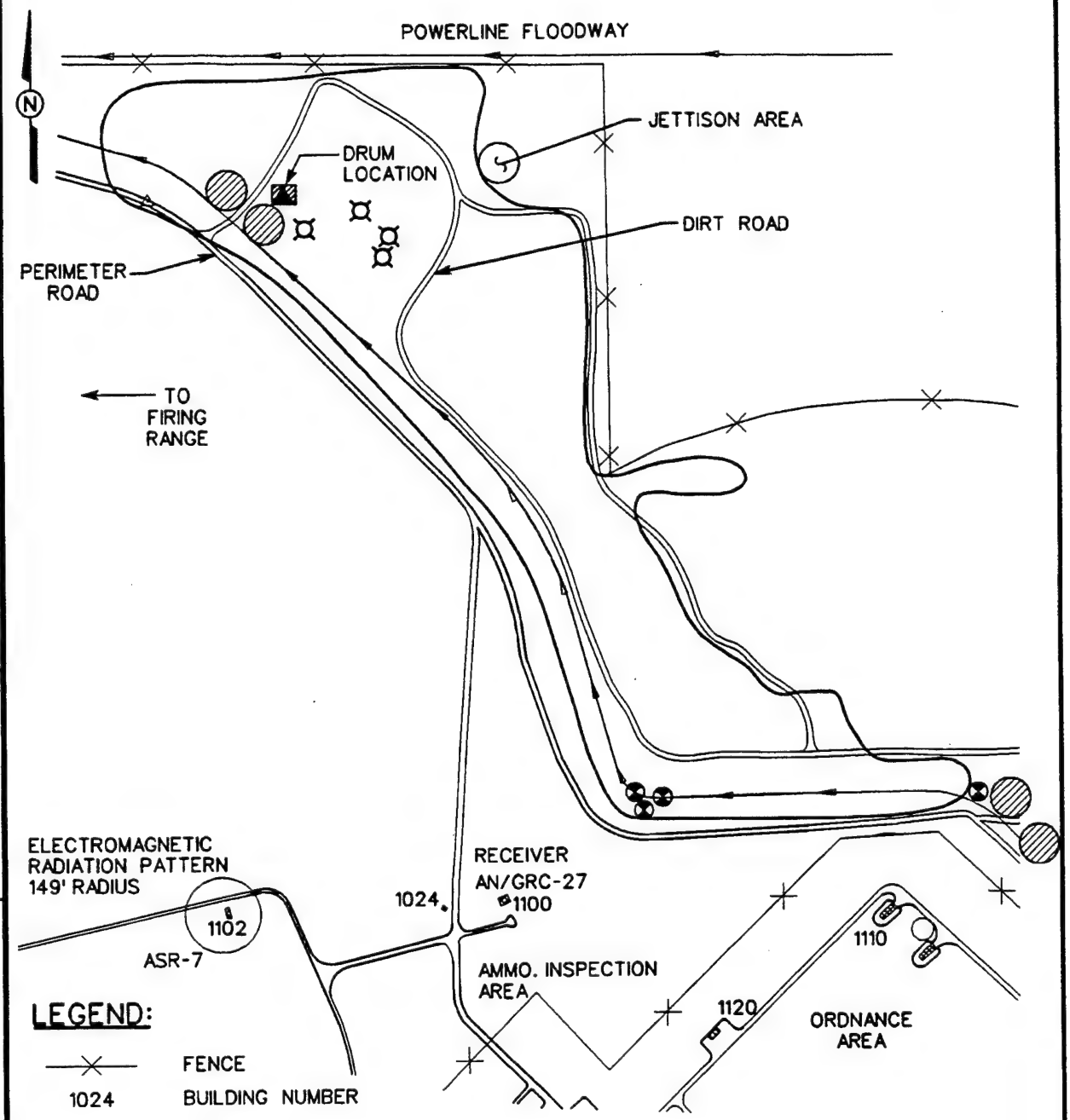
The removal of the drum and surrounding contaminated soil and concrete was completed using a decontaminated backhoe. The area was marked with barrier tape and an area 2.5 feet by 3 feet was excavated to a depth of 3 feet (Figure 3-7).

Two undisturbed soil samples (D2016 and D2017) were collected from the bottom of the excavation and analyzed for SVOCs and pesticides/PCBs by CLP to verify the absence of contamination. Sample analyses and results are described in Chapter 4.0.

After the backhoe bucket was decontaminated, clean fill was placed in the excavation and compacted with the backhoe bucket. Stakes were used to mark the sample locations and excavation limits.

3.11 Waste Profile Sampling

All of the excavated material from the removal actions was placed in 9 roll-off bins and a composite waste profile sample was collected from each bin to determine the final disposition of the material. Collection of the waste profile samples conformed with the procedures



STARTING DATE: 11/6/95 | DATE LAST REV.: | DRAFT. CHCK. BY: C. TUMLIN | INITIATOR: D. WILLEN | DWG. NO.: 409881ES.141
DRAWN BY: K. WOOD | DRAWN BY: | ENGR. CHCK. BY: D. WILLEN | PROJ. MGR.: W. CARTER | PROJ. NO.: 409881

409881ES.141 16:18:00 Dec. 18, 1995 DLB

FIGURE 3-7
SOIL REMOVAL AND SAMPLING LOCATIONS CONCRETE HARDFILL DRUM REMOVAL AREA
WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

described in the final FSP (IT, 1995b). Analyses performed on the waste profile samples were TCLP VOCs, TCLP pesticides, and TCLP RCRA metals. The analyses and results are discussed in Chapter 4.0.

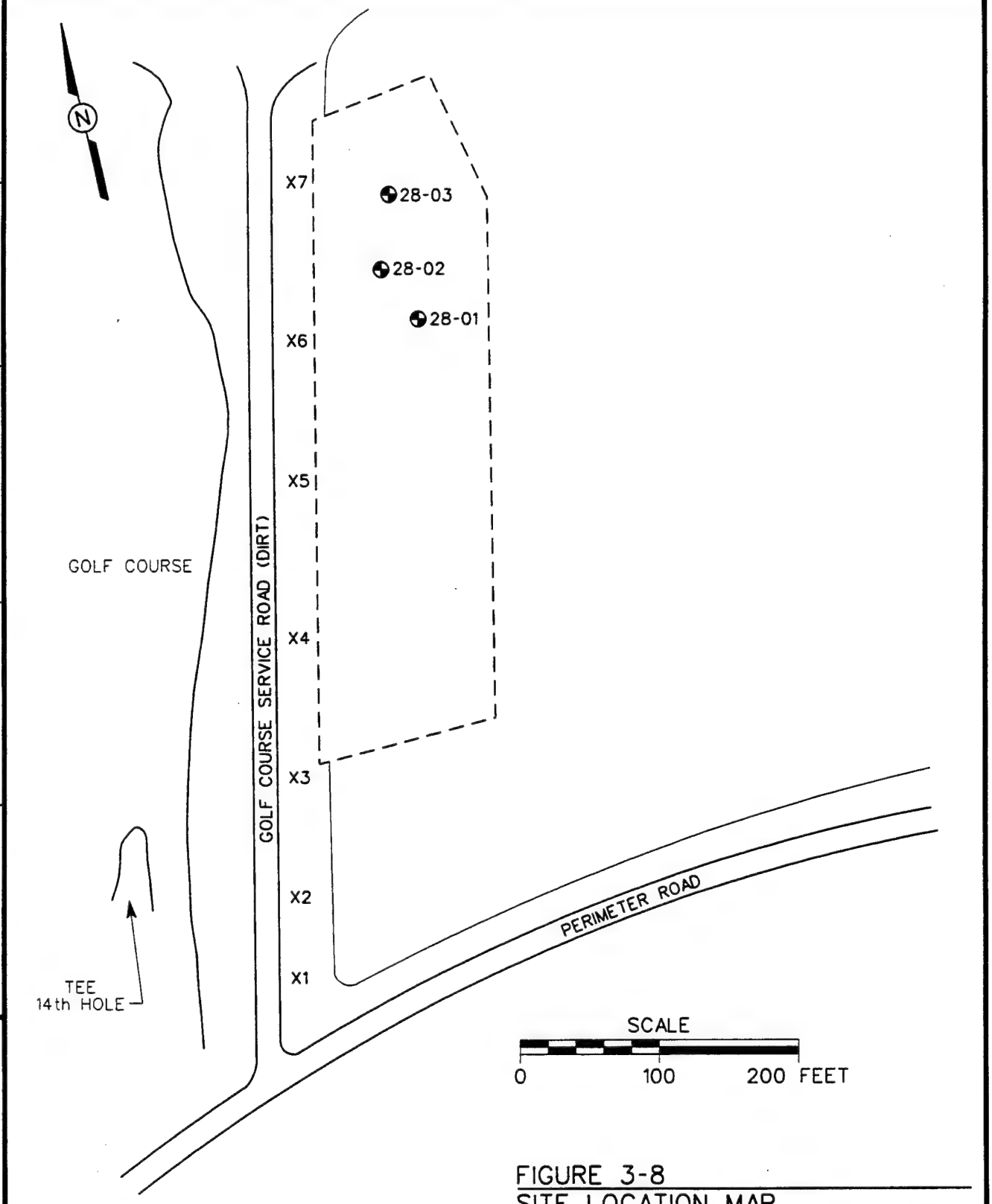
3.12 Sewage Sludge Stockpile Area (Area 28)

The sampling objective at this area was to determine if the dried sludge and associated soil were contaminated. This sampling event was not intended to characterize the sludge for proper disposal or compliance with the WWTP's NPDES permit. Sample locations were selected on the basis of visual inspection, to provide samples most likely to contain sludge. The locations were identified at the area with wooden stakes (Figure 3-8).

All work at this area was performed in accordance with the Final Work Plan, the Final Field Sampling Plan (IT, 1991b), and Quality Assurance Project Plan (IT, 1991a) for Williams AFB. Following soil sample collection at the Sludge Stockpile Area, each sample location was marked with a flag and existing soil was used to fill the sample holes.

On September 14, 1993, one soil sample was collected from each location indicated on Figure 3-8. A pre-cleaned hand trowel was used to collect samples from a depth of 12 inches into laboratory-prepared jars. The soil was a light brown or black silt. One 500-mL jar was collected at each sample location for laboratory analysis. Each sample was handled by personnel wearing clean latex gloves in addition to protective gloves. The jars were labeled with the information requested in the Field Sampling Plan.

Soil samples collected from this area were analyzed for priority pollutant metals, PCBs/pesticides, and SVOCs. The analyses and results are discussed in Chapter 4.0.



LEGEND:

X1 FENCE POST, NUMBERED FROM SOUTH TO NORTH STARTING AT PERIMETER ROAD

SAMPLING LOCATIONS

FIGURE 3-8
SITE LOCATION MAP
SEWAGE SLUDGE STOCKPILE AREA

WILLIAMS AIR FORCE BASE
ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

STARTING DATE: 03/28/96	DATE LAST REV.:	DRAFT. CHCK. BY:	INITIATOR: D. WILLEN	DWG. NO.: 409881ES.315
DRAWN BY: K. WOOD	DRAWN BY:	ENGR. CHCK. BY:	PROJ. MGR.: W. CARTER	PROJ. NO.: 409881

FILENAME: 409881ES.315 14:14:32 Mar. 28, 1996 KLW

4.0 Nature and Extent of Contamination

4.1 Characterization of Background Conditions

Regional background concentrations for inorganic species in soils were obtained from surficial soils in Gila, Maricopa, Pima, Pinal, and Yuma Counties in Arizona. Each of the U.S. Geological Survey (USGS) samples was collected from alluvial materials with a geologic provenance similar to the Base. The regional ranges of inorganic species concentrations are shown in Table 4-1. For information regarding elements that were not analyzed by the USGS, normal soil ranges were obtained from Alloway, 1990. The data in Alloway (1990) are based on worldwide averages for uncontaminated soils and have been included to provide additional perspective for values measured at the Base.

All anthropogenic organics were considered site-related, with the exception of PAH. Background concentrations were considered for PAHs because these compounds are distributed throughout the environment, primarily from the combustion of fossil fuels with subsequent atmospheric dispersion and deposition (Gschwend and Hites, 1981; Kawamura and Kaplan, 1983; LaFlamme and Hites, 1978; Thomas, 1986).

Base-Specific Surface Soil Samples. There was an agreement among the parties to the FFA that it was necessary to establish Base-specific background levels for inorganic constituents in the surface soil as recommended in the OU-1 RI report (IT, 1992a). It was on this basis that ten Base-specific background surface soil samples were collected and analyzed in September 1993. The three areas sampled (Figure 4-1) were selected based on information from aerial photographs, ecological assessment observations, and a site walk at the Base to determine areas that were undisturbed. Locations were chosen based on having no historic photographic evidence of activity that would have disturbed the soil and on visual review of each area to ensure that there had been no recent activity. This factor relied to an extent on observations from the ecological assessment team, who examined the size and type of vegetation and absence of any indication of human intrusion. Three locations were selected based on recommendations from risk assessment personnel so that there would be statistically significant results compiled from an adequate number of samples. The areas north, south, and northeast of the runways were designated because they satisfied all criteria. It was recognized that there could be residual material from jet exhaust, but considering the use of the Base, prevailing wind direction, and the fact that all surface portions of the Base east of the runways were disturbed, these areas best represent surface background conditions. Areas off

Table 4-1

Background Inorganic Species Concentrations in Soil
Operable Unit 5
Williams Air Force Base, Arizona

Constituent	Soil (mg/kg)	
	Base-Specific Range[a]	Regional Range[b]
Antimony	ND[c] (<12)	< 1
Arsenic	2.3 to 4.3	2 to 97
Barium	NA[d]	-[e]
Beryllium	1.0 to 1.6	1.0 to 1.5
Cadmium	ND (<1)	0.01 to 2.0[f]
Chromium	16.9 to 24.8	15 to 100
Cobalt	NA	-
Copper	ND (<5)	15 to 200
Lead	10.4 to 19.4	10 to 100
Mercury	ND (<0.2)	0.01 to 0.5[f]
Nickel	15.6 to 24.7	7 to 50
Selenium	0.21 to 0.24	0.1 to 5[f]
Silver	ND (<2)	0.01 to 8[f]
Thallium	ND (<2)	0.1 to 0.8[f]
Zinc	ND (<4)	25 to 150

[a] The average soil concentration represents the mean of nine surface soil samples plus one duplicate collected at Williams AFB in September 1993. The range presents the low and high values for the ten samples.

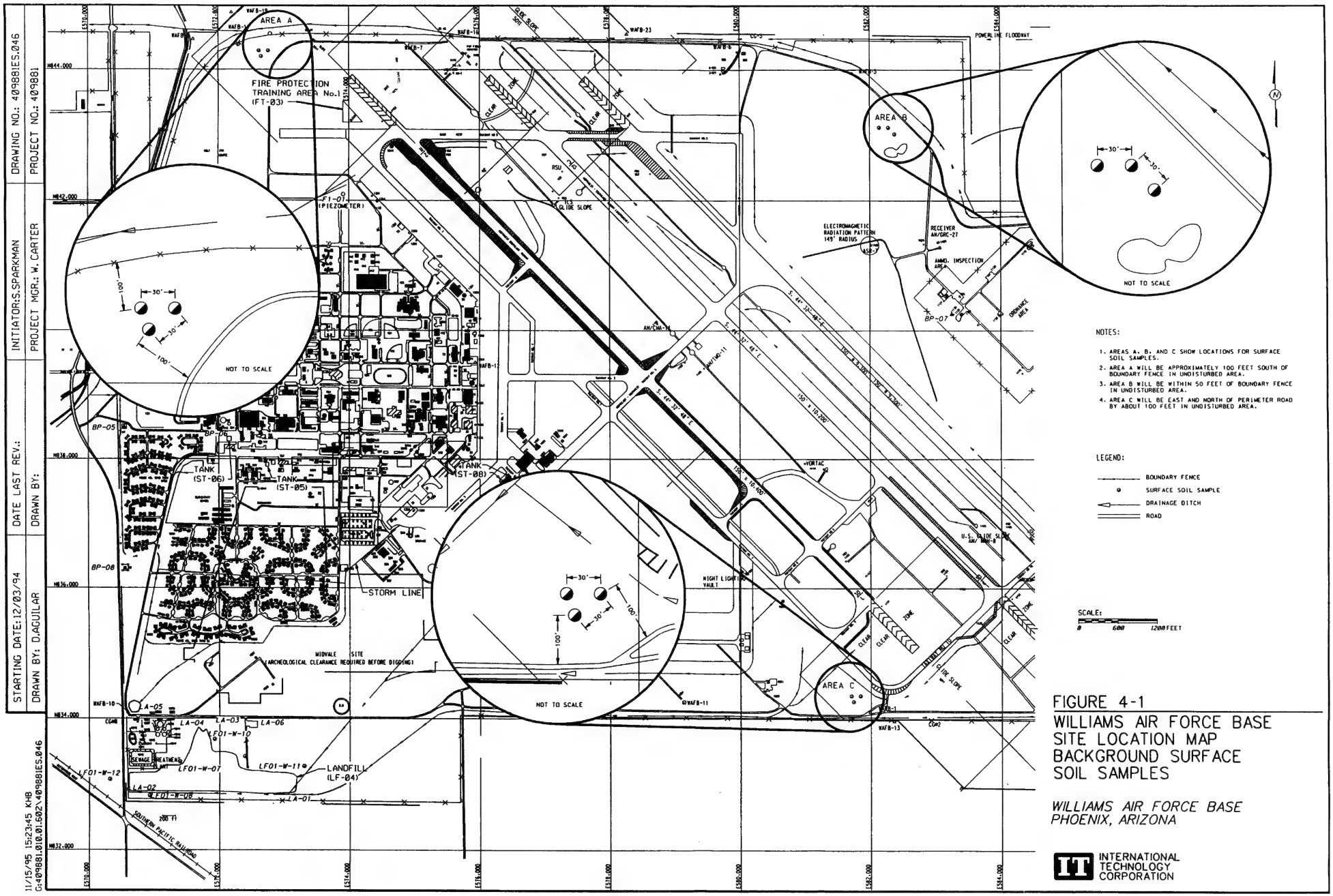
[b] Data obtained from surficial soils in Gila, Maricopa, Pima, Pinal, and Yuma counties.

[c] ND - Not detected.

[d] NA - Not analyzed because this chemical is not a priority pollutant metal. Base-specific background samples were analyzed for priority pollutant metals in accordance with the approved work plan.

[e] "-" Not available.

[f] Data obtained from B. J. Alloway, 1990.



STARTING DATE: 12/03/94 | DATE LAST REV.: | INITIATOR: S.SPARKMAN | DRAWING NO.: 409881ES.046
DRAWN BY: D.AGUILAR | DRAWN BY: | PROJECT MGR.: W. CARTER | PROJECT NO.: 409881

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FIGURE 4-1
WILLIAMS AIR FORCE BASE
SITE LOCATION MAP
BACKGROUND SURFACE
SOIL SAMPLES

WILLIAMS AIR FORCE BASE
PHOENIX, ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

the Base have been more disturbed than on the Base due to agricultural use, and could have also been affected by exhaust from jets as well as crop dusting planes. The background metals that were analyzed for included antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

The OU-3 FSP addendum (IT, 1993c), and OU-1 RI work plan addendum (IT, 1993d) specified the exact locations and techniques that were approved by the FFA Parties. Nine surface soil samples and a duplicate were collected and the analytical results were averaged to determine a Base-specific background concentration for each inorganic constituent. All Base-specific background concentrations and the regional range of concentrations detected for inorganic species in soil are presented in Table 4-1.

4.2 Analytical Samples and Results

Table 3-1 specified the analytical parameters, methods used, and samples taken at each OU-5 site. Table 4-2 provides the summary of the detected compounds for each site. Appendix A includes the summary of the validated analytical data. The following sections review the implication of the analytical results for each site.

4.2.1 Airfield USTs (ST-25)

The only constituent detected at ST-25 was methylene chloride, which was in one of the two samples taken. The maximum estimated concentration was 3 micrograms per kilogram (µg/kg). Because methylene chloride is a laboratory reagent, this can be explained as a laboratory contaminant. Even if it were not attributed to the laboratory, the concentration is below both the Arizona HBGL and Region IX PRG levels. This site, therefore, requires no further remedial action.

4.2.2 Paint Shop Leach Field (WP-27)

Nine metals were detected in each of the three samples at this site. Of these metals, however, only arsenic and beryllium exceeded the Arizona HBGL and Region IX PRG levels. As shown on Table 4-2, the maximum arsenic concentration was 9.6 mg/kg at a depth of 5 feet in sample D2005. This declined to 7.70 mg/kg at 3.5 feet in sample D2003. Beryllium was at 0.43 mg/kg in sample D2005 and 0.49 mg/kg in sample D2003. Each was also above the background level for these metals.

Table 4-2

Summary of Detected Compounds
OU-5 Remedial Investigation
Williams AFB, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Result	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
AIRFIELD USTs, ST-25																
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	METHYLENE CHLORIDE	2	2	J	11	UG/KG	180,000	11,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	METHYLENE CHLORIDE	3	3	J	11	UG/KG	180,000	11,000		
PAINT SHOP LEACH FIELD, WP-27																
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	ARSENIC	7.70	7.7		0.72	MG/KG	0.91	0.32		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	BERYLLIUM	0.49	0.49	J	0.24	MG/KG	0.32	0.14		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	CADMIUM	1.80	1.8	J	1.2	MG/KG	58	38		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	CHROMIUM	25.20	25.2		1.9	MG/KG	580	210		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	COPPER	61.10	61.1		1.4	MG/KG	4,300	2,800		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	LEAD	18.30	18.3		0.48	MG/KG	400	400		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	NICKEL	29.50	29.5		4.5	MG/KG	2,300	1,500		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	THALLIUM	1.00	1	J	0.72	MG/KG	8.2	NIA		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	ZINC	149.00	149		0.95	MG/KG	35,000	23,000		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	ARSENIC	5.90	5.9		0.7	MG/KG	0.91	0.32		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	CHROMIUM	23.90	23.9		1.9	MG/KG	580	210		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	COPPER	32.50	32.5		1.4	MG/KG	4,300	2,800		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	LEAD	18.20	18.2		0.47	MG/KG	400	400		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	NICKEL	18.00	18		4.4	MG/KG	2,300	1,500		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	ZINC	86.50	86.5		0.93	MG/KG	35,000	23,000		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	ARSENIC	9.60	9.6		0.7	MG/KG	0.91	0.32		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	BERYLLIUM	0.43	0.43	J	0.23	MG/KG	0.32	0.14		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	CHROMIUM	24.60	24.6		1.9	MG/KG	580	210		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	COPPER	48.10	48.1		1.4	MG/KG	4,300	2,800		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	LEAD	18.50	18.5		0.47	MG/KG	400	400		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	NICKEL	21.60	21.6	J	4.4	MG/KG	2,300	1,500		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	SELENIUM	0.86	0.86	J	0.7	MG/KG	580	380		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	ZINC	122.00	122		0.94	MG/KG	35,000	23,000		
PRIME BEEF YARD, SS-29																
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	ARSENIC	5.20	5.2	J	0.68	MG/KG	0.91	0.32		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	BERYLLIUM	0.78	0.78	J	0.23	MG/KG	0.32	0.14		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	CHROMIUM	29.60	29.6		1.8	MG/KG	580	210		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	COPPER	155.00	155		1.4	MG/KG	4,300	2,800		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	LEAD	21.40	21.4		0.46	MG/KG	400	400		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	NICKEL	29.10	29.1		4.3	MG/KG	2,300	1,500		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	SELENIUM	1.70	1.7	J	0.68	MG/KG	580	380		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	THALLIUM	1.10	1.1	J	0.68	MG/KG	8.2	NIA		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	ZINC	232.00	232		0.91	MG/KG	35,000	23,000		

Table 4-2

Summary of Detected Compounds
OU-5 Remedial Investigation
Williams AFB, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Result	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	METHYLENE CHLORIDE	4	4	J	11	UG/KG	180,000	11,000		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	ARSENIC	6.30	6.3	J	0.66	MG/KG	0.91	0.32		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	BERYLLIUM	0.58	0.58	J	0.22	MG/KG	0.32	0.14		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	CHROMIUM	35.20	35.2		1.8	MG/KG	580	210		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	COPPER	79.50	79.5		1.3	MG/KG	4,300	2,800		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	LEAD	22.60	22.6		0.44	MG/KG	400	400		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	NICKEL	30.10	30.1	J	4.2	MG/KG	2,300	1,500		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	SELENIUM	0.90	0.9	J	0.66	MG/KG	580	380		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	ZINC	164.00	164		0.88	MG/KG	35,000	23,000		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	ARSENIC	5.20	5.2	J	0.69	MG/KG	0.91	0.32		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	BERYLLIUM	0.58	0.58	J	0.23	MG/KG	0.32	0.14		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	CHROMIUM	28.10	28.1		1.8	MG/KG	580	210		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	COPPER	102.00	102		1.4	MG/KG	4,300	2,800		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	LEAD	20.80	20.8		0.46	MG/KG	400	400		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	NICKEL	24.40	24.4	J	4.4	MG/KG	2,300	1,500		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	THALLIUM	0.92	0.92	J	0.69	MG/KG	8.2	NIA		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	ZINC	200.00	200		0.92	MG/KG	35,000	23,000		
MUNITIONS INCINERATOR, FACILITY 1119, SS-34																
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	ARSENIC	5.80	5.8		0.63	MG/KG	0.91	0.32		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	CHROMIUM	22.10	22.1		1.7	MG/KG	580	210		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	COPPER	28.50	28.5		1.3	MG/KG	4,300	2,800		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	LEAD	16.70	16.7		0.42	MG/KG	400	400		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	NICKEL	18.80	18.8		4	MG/KG	2,300	1,500		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	SELENIUM	1.50	1.5	J	0.63	MG/KG	580	380		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	THALLIUM	1.50	1.5	J	0.63	MG/KG	8.2	NIA		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	ZINC	84.80	84.8		0.84	MG/KG	35,000	23,000		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	ARSENIC	5.30	5.3		0.64	MG/KG	0.91	0.32		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	BERYLLIUM	0.65	0.65	J	0.21	MG/KG	0.32	0.14		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	CHROMIUM	23.90	23.9		1.7	MG/KG	580	210		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	COPPER	32.40	32.4		1.3	MG/KG	4,300	2,800		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	LEAD	16.60	16.6		0.43	MG/KG	400	400		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	NICKEL	21.50	21.5	J	4	MG/KG	2,300	1,500		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	SELENIUM	0.86	0.86	J	0.64	MG/KG	580	380		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	THALLIUM	0.99	0.99	J	0.64	MG/KG	8.2	NIA		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	ZINC	78.80	78.8		0.85	MG/KG	35,000	23,000		
CONCRETE HARDFILL AREA, LF-26																
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDE	1.1	1.1	J	3.5	UG/KG	4,000	1,300		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Dieldrin	12	12		3.5	UG/KG	90	28		

Table 4-2

Summary of Detected Compounds
OU-5 Remedial Investigation
Williams AFB, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Result	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
AIRFIELD USTs, ST-25																
Method Blank	Q3001	7/24/95	WATER	VOC	0	0	ACETONE	6	6	JB	10	UG/L			700	610
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	ACETONE	6	6	JB	10	UG/L			700	610
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	ACETONE	2	2	JB	10	UG/L			700	610
PAINT SHOP LEACH FIELD, WP-27																
Method Blank	Q3004	7/21/95	WATER	METAL	0	0	ZINC	9	9	B	4	UG/L			2100	11000
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	ZINC	80	80		4	UG/L			2100	11000
WASTE PROFILE SAMPLE																
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	METHYLENE CHLORIDE	2.1	2.1		1	UG/L			4.7	4.3

NOTES: Golf Course Maintenance Area samples D2010 and D2011 were nondetects; Building 1070 was not sampled (see Section 3.8).
J = Value is between detection limit and reporting limit. Value is estimated.
NA = No information available.

4.2.3 Prime Beef Yard (SS-29)

Nine metals were detected in the four samples (D2006, D2007, D2008, and D2009) at this site. Three of the samples were near Building 766 and the fourth was near the area of a suspected TPH spill. Of these metals, however, only arsenic and beryllium exceeded the Base background range for these metals and also exceeded the Arizona HBGL and Region IX PRG levels. As shown on Table 4-2, the maximum arsenic concentration was 6.3 mg/kg at a depth of 3.5 feet in sample D2008, and 5.2 mg/kg in samples D2006 and D2009. Beryllium was 0.78 mg/kg in sample D2006 and 0.58 mg/kg in samples D2008 and D2009. Methylene chloride was detected at an estimated concentration of 4 µg/kg in sample D2006. This was well below either the Arizona HBGL and Region IX PRG levels.

4.2.4 Golf Course Maintenance Area (SS-31)

Two samples were taken at this area, as shown in Figure 3-4, but no contaminants were detected.

4.2.5 Munitions Incinerator (Facility 1119, SS-34)

Two samples were taken at this area, as shown in Figure 3-6. Nine metals were detected in sample D2015 and eight metals were detected in sample D2014. Of these metals, however, only arsenic and beryllium exceeded the Base background range for metals and also exceeded the Arizona HBGL and Region IX PRG levels. As shown on Table 4-2, the maximum arsenic concentration was 5.8 mg/kg at a depth of 3.5 feet in sample D2014, and 5.3 mg/kg in sample D2015. Beryllium was detected in only one sample, D2015, at 0.65 mg/kg, also at 3.5 feet.

4.2.6 Concrete Hardfill Drum Removal Area (LF-26)

One sample was taken at this site, as shown in Figure 3-7. Low levels of the pesticides 4,4-DDE (1.1 µg/kg) and dieldrin (12 µg/kg) were detected in the sample. Both were well below the Arizona HBGL and Region IX PRG levels.

4.2.7 Waste Profile Samples

Nine samples were collected; one sample per bin. Methylene chloride was detected only in a trip blank at 2.1 µg/L which is well below the Arizona HBGL and Region IX PRG levels.

4.2.8 Sewage Sludge Stockpile Area (Area 28)

Soil samples sent to the laboratory for three sample locations at this area (including one duplicate sample from 28-01) were analyzed for priority pollutant metals, SVOCs, and PCBs/pesticides. Analytical results are provided in Table 4-3.

In summary, eleven metals were reported for some or all of the samples from this area:

- Arsenic - 1.6 mg/kg (28-02) and 1.4 mg/kg (28-03).
- Beryllium - 0.63 mg/kg (28-02).
- Cadmium - 8.3 mg/kg and 9.6 mg/kg (28-01 duplicate samples).
- Chromium - 11.8 mg/kg to 141 mg/kg (all three locations).
- Copper - 63.7 mg/kg to 159 mg/kg (all three locations).
- Lead - 7.3 mg/kg to 90.9 mg/kg (all three locations).
- Mercury - 2.1 mg/kg and 3.4 mg/kg (28-01 duplicate samples).
- Nickel - 9.6 mg/kg to 21.9 mg/kg (all three locations).
- Selenium - 1.5 mg/kg and 1.2 mg/kg (28-01 duplicate samples).
- Silver - 2 mg/kg (28-01), and 51.1 mg/kg (28-02).
- Zinc - 208 mg/kg to 413 mg/kg (all three locations).

Eight SVOCs were detected at some or all of the sample locations:

- Bis(2-ethylhexyl)phthalate - 0.73 mg/kg and 0.54 mg/kg (28-01 duplicate samples), and 0.079 mg/kg (28-02).
- Butyl benzyl phthalate - 0.087 mg/kg (28-03).
- Di-n-butyl phthalate - 0.087 mg/kg (28-02) and 0.12 mg/kg (28-03).
- Diethyl phthalate - 0.023 mg/kg and 0.034 mg/kg (28-01 duplicate samples), and 0.074 mg/kg (28-03).
- Dimethyl phthalate - 0.14 mg/kg (28-01).
- Pyrene - 0.03 mg/kg (28-01), and 0.05 mg/kg (28-02).
- 4-chloro-3-methylphenol - 0.03 mg/kg (28-02).
- Pentachlorophenol - 0.029 mg/kg (28-02).

Table 4-3

Analytical Results for Detected Compounds
Sewage Sludge Stockpile Area, Area 28
Operable Unit 5
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Method	Compound	Validated Result	Validated Qualifier	Detection Limit	Units	Soil		
									EPA-PRG Industrial	EPA-PRG Residential	AZ HBGL
28-01	H2173	14-Sep-93	Metal	Arsenic	4.2	J	2	mg/kg	3.3	0.97	840
28-01	H2172	14-Sep-93	Metal	Arsenic	4.4	J	2	mg/kg	3.3	0.97	840
28-01	H2172	14-Sep-93	Metal	Beryllium	0.6	J	1	mg/kg	1.3	0.4	0.32
28-01	H2173	14-Sep-93	Metal	Beryllium	0.63	J	1	mg/kg	1.3	0.4	0.32
28-01	H2172	14-Sep-93	Metal	Cadmium	8.3		1	mg/kg	490	39	58
28-01	H2173	14-Sep-93	Metal	Cadmium	9.6		1	mg/kg	490	39	58
28-01	H2172	14-Sep-93	Metal	Chromium	141		2	mg/kg	1600	940	1700
28-01	H2173	14-Sep-93	Metal	Chromium	134		2	mg/kg	1600	940	1700
28-01	H2172	14-Sep-93	Metal	Copper	137	J	5	mg/kg	76000	2900	22000
28-01	H2173	14-Sep-93	Metal	Copper	159	J	5	mg/kg	76000	2900	22000
28-01	H2172	14-Sep-93	Metal	Lead	90.9		0.6	mg/kg	NIA	500	84
28-01	H2173	14-Sep-93	Metal	Lead	87.9		0.6	mg/kg	NIA	500	84
28-01	H2173	14-Sep-93	Metal	Mercury	3.4		0.2	mg/kg	610	23	35
28-01	H2172	14-Sep-93	Metal	Mercury	2.1		0.2	mg/kg	610	23	35
28-01	H2172	14-Sep-93	Metal	Nickel	20.8		8	mg/kg	41000	1600	2300
28-01	H2173	14-Sep-93	Metal	Nickel	21.9		8	mg/kg	41000	1600	2300
28-01	H2172	14-Sep-93	Metal	Selenium	1.5	J	1	mg/kg	10000	390	840

Table 4-3

Analytical Results for Detected Compounds
Sewage Sludge Stockpile Area, Area 28
Operable Unit 5
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Method	Compound	Validated Result	Validated Qualifier	Detection Limit	Units	Soil		
									EPA-PRG Industrial	EPA-PRG Residential	AZ HBGL
28-01	H2173	14-Sep-93	Metal	Selenium	1.2	J	1	mg/kg	10000	390	840
28-01	H2172	14-Sep-93	Metal	Silver	44.9		2	mg/kg	10000	390	840
28-01	H2173	14-Sep-93	Metal	Silver	51.1		2	mg/kg	10000	390	840
28-01	H2172	14-Sep-93	Metal	Zinc	382	J	4	mg/kg	10000	23000	23000
28-01	H2173	14-Sep-93	Metal	Zinc	413	J	4	mg/kg	10000	23000	23000
28-01	H2173	14-Sep-93	Pest	4,4'-DDD	0.072	J	0.0033	mg/kg	12	3.5	5.7
28-01	H2173	14-Sep-93	Pest	4,4'-DDE	0.12		0.0033	mg/kg	8.4	2.5	4
28-01	H2172	14-Sep-93	Pest	4,4'-DDE	0.11	J	0.0033	mg/kg	8.4	2.5	4
28-01	H2172	14-Sep-93	Pest	4,4'-DDT	0.12	J	0.0033	mg/kg	8.4	2.5	4
28-01	H2172	14-Sep-93	Pest	Alpha-Chlordane	0.16	J	0.0017	mg/kg	2.2	0.66	1
28-01	H2173	14-Sep-93	Pest	Alpha-Chlordane	0.13	J	0.0017	mg/kg	2.2	0.66	1
28-01	H2173	14-Sep-93	Pest	Dieldrin	0.23		0.0033	mg/kg	0.18	0.053	0.09
28-01	H2172	14-Sep-93	Pest	Dieldrin	0.19	J	0.0033	mg/kg	0.18	0.053	0.09
28-01	H2172	14-Sep-93	Pest	Gamma-Chlordane	0.12	J	0.0017	mg/kg	2.2	0.66	1
28-01	H2173	14-Sep-93	Pest	Gamma-Chlordane	0.13	J	0.0017	mg/kg	2.2	0.66	1
28-01	H2172	14-Sep-93	SVOC	Diethyl phthalate	0.023	J	0.33	mg/kg	100000	31000	94000
28-01	H2173	14-Sep-93	SVOC	Diethyl phthalate	0.034	J	0.33	mg/kg	100000	31000	94000

Table 4-3

Analytical Results for Detected Compounds
Sewage Sludge Stockpile Area, Area 28
Operable Unit 5
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Method	Compound	Validated Result	Validated Qualifier	Detection Limit	Units	Soil		
									EPA-PRG Industrial	EPA-PRG Residential	AZ HBGL
28-01	H2172	14-Sep-93	SVOC	Dimethyl phthalate	0.14	J	0.33	mg/kg	100000	100000	NIA
28-01	H2172	14-Sep-93	SVOC	Pyrene	0.03	J	0.33	mg/kg	31000	1200	3500
28-02	H2174	14-Sep-93	Metal	Arsenic	1.6	J	2	mg/kg	3.3	0.97	840
28-02	H2174	14-Sep-93	Metal	Chromium	15.7		2	mg/kg	1600	940	1700
28-02	H2174	14-Sep-93	Metal	Copper	63.7	J	5	mg/kg	76000	2900	22000
28-02	H2174	14-Sep-93	Metal	Lead	17.4		0.6	mg/kg	NIA	500	84
28-02	H2174	14-Sep-93	Metal	Nickel	10.3	J	8	mg/kg	41000	1600	2300
28-02	H2174	14-Sep-93	Metal	Silver	2	J	2	mg/kg	10000	390	840
28-02	H2174	14-Sep-93	Metal	Zinc	208	J	4	mg/kg	100000	23000	23000
28-02	H2174	14-Sep-93	Pest	4,4'-DDE	0.041		0.0033	mg/kg	8.4	2.5	4
28-02	H2174	14-Sep-93	Pest	4,4'-DDT	0.0079	J	0.0033	mg/kg	8.4	2.5	4
28-02	H2174	14-Sep-93	Pest	Alpha-Chlordane	0.0035	J	0.0017	mg/kg	2.2	0.66	1
28-02	H2174	14-Sep-93	Pest	Dieldrin	0.0037	J	0.0033	mg/kg	0.18	0.053	0.09
28-02	H2174	14-Sep-93	Pest	Gamma-Chlordane	0.0039	J	0.0017	mg/kg	2.2	0.66	1
28-02	H2174	14-Sep-93	SVOC	4-Chloro-3-methylphenol	0.03	J	0.33	mg/kg	NIA	NIA	NIA
28-03	H2174	14-Sep-93	SVOC	Penthachlorophenol	0.029	J	0.8	mg/kg	24	7.1	11
28-03	H2174	14-Sep-93	SVOC	Pyrene	0.05	J	0.33	mg/kg	31000	1200	3500

Table 4-3

Analytical Results for Detected Compounds
Sewage Sludge Stockpile Area, Area 28
Operable Unit 5
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Method	Compound	Validated Result	Validated Qualifier	Detection Limit	Units	Soil		
									EPA-PRG Industrial	EPA-PRG Residential	AZ HBGL
28-03	H2175	14-Sep-93	Metal	Arsenic	1.4	J	2	mg/kg	3.3	0.97	840
28-03	H2175	14-Sep-93	Metal	Chromium	11.8		2	mg/kg	1600	940	1700
28-03	H2175	14-Sep-93	Metal	Copper	66.8	J	5	mg/kg	76000	2900	22000
28-03	H2175	14-Sep-93	Metal	Lead	7.3		0.6	mg/kg	NIA	500	84
28-03	H2175	14-Sep-93	Metal	Nickel	9.6	J	8	mg/kg	41000	1600	2300
28-03	H2175	14-Sep-93	Metal	Zinc	228	J	4	mg/kg	100000	23000	23000
28-03	H2175	14-Sep-93	Pest	4,4'-DDE	0.037		0.0033	mg/kg	8.4	2.5	4
28-03	H2175	14-Sep-93	SVOC	Diethyl phthalate	0.074	J	0.33	mg/kg	100000	31000	94000

Notes:

J = Estimated value.
NIA = No Information Available.

No PCBs were reported for this area, but six pesticides were detected at some or all of the sample locations:

- DDD - 0.072 mg/kg (28-01).
- DDE - 0.037 mg/kg to 0.12 mg/kg (all three locations).
- DDT - 0.12 mg/kg (28-01), and 0.079 mg/kg (28-02).
- Alpha-chlordane - 0.13 mg/kg and 0.16 mg/kg (28-01 duplicate samples), and 0.0035 mg/kg (28-02).
- Gamma-chlordane - 0.12 mg/kg and 0.13 mg/kg (28-01 duplicate samples), and 0.0039 mg/kg (28-02).
- Dieldrin - 0.19 mg/kg and 0.23 mg/kg (28-01 duplicate samples), and 0.0037 mg/kg (28-02).

Some of the SVOC and pesticide values are estimated (J) values below the sample quantification limit, which varied depending on the dilution factor required for analysis.

Three SVOCs (bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, and di-butyl phthalate) were detected in associated blank analyses, and are omitted from Table 4-3 because of the likelihood that their presence was due to laboratory contamination.

A duplicate sample was collected from sample location 28-01. Calculated RPD values for SVOCs detected in both of the duplicate samples range from 8 to 39 percent, while RPDs for metals were between 5 and 47 percent. Most of the calculated RPD values for the duplicate samples were within acceptable limits; therefore, the high values may be related to natural variability of the constituents or other factors, rather than problems with laboratory analysis.

A risk assessment is provided in Section 6.0.

5.0 Contaminant Fate and Transport Discussion

5.1 Contaminant Persistence in the Environment

Chemical persistence in environmental media is determined by the chemical's ability to move through a medium, to transfer from one medium to another, and to transform or degrade. This in turn is controlled by the characteristics of the chemicals (e.g., solubility, volatility, density, and affinity for organic and inorganic surfaces) and of the environmental medium (i.e., mineralogy, organic carbon content and porosity of the soil, and temperature and composition of groundwater). The migration and persistence for various compounds found in the soil/groundwater system are discussed in the following paragraph.

Chemicals in the soil vadose zone may migrate to groundwater via water infiltration and by dispersion and diffusion along water film pathways on soil grains. Migration of chemicals from the vadose zone to groundwater is generally controlled by adsorption, precipitation, and degradation reactions in the soil. Adsorption and precipitation are the important mechanisms for the retardation of inorganic compounds, while adsorption and degradation most often control the rate of migration of organic constituents.

5.2 Inorganic Compounds

Unlike organic compounds, inorganic chemicals do not degrade in the environment, but they may change chemical form or speciation. They are generally considered to be indefinitely persistent. Dissolved inorganic metals may interact with soil or other solids by ion exchange, adsorption, precipitation, or complexation and can act as catalysts in biodegradation processes. These physiochemical processes are affected by pH, composition of soil water in the vadose zone, reduction-oxidation (redox) conditions, and the type and amount of organic matter, clay minerals, and oxyhydroxide minerals. In general, organic matter is scarce in southwestern soils and of minor importance in the retardation of inorganic compounds. The alkaline environment of most southwestern desert soils is favorable for precipitation of carbonate and oxyhydroxide compounds, which can incorporate a variety of inorganic compounds in their mineral structure or on their surfaces.

The solubility of metal compounds (amorphous solids or minerals) in alkaline soil water is low (e.g., $PbCO_3$) to moderate (e.g., $PbSO_4$). Given the limited solubility of most metals in this alkaline environment, and their affinity for ion exchange and adsorption reactions, most metal compounds have limited mobility in the vadose-zone environment of the southwest. However, soil water containing elevated levels of chloride, bicarbonate, sulfate, or phosphate

can enhance the solubility and mobility of metal compounds by the formation of aqueous complexes (e.g., $PbCl^{+}$, $MnSO_4^{\circ}$, $UO_2(CO_3)_2^{-2}$, etc). Additionally, local extreme pH and E_H (i.e., the oxidation-reduction potential) conditions can significantly increase the solubility and mobility of metals in the vadose environment. Therefore, the quantity of the metal in the source, the solubility of the metal compound, the composition of soil water, and the adsorption capacity of the soils determine the migration potential of the metal element in the vadose environment.

All natural soils contain trace levels of metals. The presence of metals in soil is not indicative of contamination. This trace level of metal concentration, known as background concentration, is primarily related to the parent material(s) from which the soil was formed. The basic environmental concern of inorganic compounds in soils is when the metal is in its soluble form. Metals associated with the aqueous phase of soils are subject to migrate with soil water and may be transported through the vadose zone to groundwater.

As summarized by Shuman (1991), in a soil environment where metals have been introduced by human activities, their fate can be found in one or more of the following:

- Dissolved in the soil water
- Adsorbed on inorganic soil constituents
- Associated with soil organic matter
- Occupying exchange sites on inorganic constituents
- Precipitated as nearly pure or mixed solids.

Metal ions may be bound to soil particulates by a combination of forces ranging from electrostatic to covalent forces (Mortland, 1985). When stronger covalent bonding dominates, certain ions are specifically bound and the reversibility of exchange decreases. This type of bonding may occur in organic matter, clays, and hydrous oxides, all of which may be present in Basewide soils in significant amounts (Roy et al., 1989; Scrivner et al., 1986; Gerritse and van Driel, 1984).

In the alkaline soils of the southwest, most heavy metals become less mobile with an increase in pH. This observation can be explained by a number of reactions:

- Precipitation of heavy metal hydroxides (Sposito, 1984)

- Changes in the carbonate and phosphate concentrations in the soil/groundwater (Huang et al., 1977; Sanchez and Lee, 1973)

- Adsorption and desorption of metals by hydrous oxides (Aiken et al., 1985)
- Formation of iron and manganese oxides (Suarez and Langmuir, 1976; Murray, 1975).

The principal inorganic contaminants for OU-5 are arsenic and beryllium. The distribution of these contaminants in soil and sediment are listed in Tables 4-1 and 4-2. Because only arsenic and beryllium have been detected above ambient levels at the various sites under investigation, this discussion is limited to the behavior of these elements in the vadose zone. Relevant physical and chemical properties of the inorganic primary contaminants and their persistence in the vadose environment are discussed in the following paragraphs.

Arsenic (As) is a ubiquitous, naturally occurring element often found in association with iron, copper, and/or lead. The primary commercial use of arsenic is pesticide and herbicide production, and it is finding increasing use as a doping agent in solid-state devices. In the vadose environment, arsenic can exist in several oxidation states. Under oxidizing conditions, arsenate (As V) is the stable oxidation state and arsenic acid (H_3AsO_4) and its dissociation products ($H_2AsO_4^-$, $HAsO_4^{-2}$, AsO_4^{-3}) are of importance for arsenic transport over a wide range of pH conditions. When present as arsenite (As III), As_2O_3 oxide has limited stability under transitional E_H conditions below a pH of 8. Hydroxide, oxyhydroxide, and oxyanions that may form in water contacting As III compounds include $As(OH)_3^o$, $H_2AsO_3^-$, $HAsO_3^{-2}$, AsO_3^{-3}, and AsO_2^-. Under reducing conditions in the presence of sulfur, the relatively insoluble sulfides As_2S_3 and AsS form, while addition of iron to this system can result in formation of arsenopyrite (FeAsS).

Based on these described chemical properties, arsenic may be mobile under oxidizing conditions to slightly mobile under transitional E_H conditions if a significant source is present. However, in alkaline soils, the oxyhydroxide and oxyanions of arsenic have a strong affinity for iron oxyhydroxide surfaces (e.g., goethite, FeOOH), and their concentrations in soil water are kept low by adsorption to these surfaces. Additionally, conditions favorable for the precipitation of iron hydroxide can result in significant removal of arsenic by substitution of As (III) into the $Fe(OH)_3$ structure. Therefore, arsenic is generally immobilized in alkaline southwestern soils by adsorption and precipitation reactions associated with iron compounds.

Beryllium (Be) is a naturally occurring element found in more than 30 minerals, with the most important commercial sources being beryl ($Be_3Al_2Si_6O_{18}$) and bertrandite ($Be_4Si_2O_8:H_2O$). The primary uses of beryllium include its use as a structural material in

high-speed aircraft, missiles, spacecraft, and communication satellites; as an alloying agent in producing beryllium copper used in springs, electrical contacts, and spot-welding electrodes; and as a neutron moderator in nuclear reactors and weapons. Beryllium is nearly insoluble as beryllium oxide (BeO) over most observed pH and E_H conditions in the environment. Formation of Be^{+2} ion may be important under acidic conditions (pH less than 4), while the oxyanion BeO_2^{-2} may form under extreme basic conditions (pH greater than 12). Due to the very low solubility of BeO, beryllium will be immobilized in alkaline southwestern soils.

5.3 Organic Compounds

The mobility of organic compounds within the saturated zone is affected by chemical processes that are in part dependent on their volatility, the octanol-water partition coefficient (K_{ow}), the water solubility, and the concentration. In general, the more insoluble in water an organic compound is, the more hydrophobic it is and the more likely it is to be absorbed on a sediment or organic surface. These compounds also have a tendency toward self-association in a polar medium such as water. Hydrophobic compounds tend to have a higher K_{ow} and a greater affinity to organic matter contained within the sediment matrix. Table 5-1 contains physical and chemical characteristics of various organic compounds detected in site soils and groundwater. Compounds such as acetone, benzene, and the chlorinated aliphatic hydrocarbons with high aqueous solubilities also have relatively low K_{ow}s. When present in the groundwater at low concentrations, migration of these compounds tends to be more rapid than other compounds (e.g., phthalates, pesticides, or large aromatic compounds such as the compounds that have low solubilities and high K_{ow}s). Even compounds with relatively low K_{ow}s will, however, exhibit some attenuation if the organic content of the soil/aquifer matrix is high.

5.4 Summary

The inorganic and organic analytes that exist at the OU-5 sites under this RI will pose no threat to groundwater due to the low concentrations present, the adsorption and precipitation reactions that occur in the vadose zone, and the extreme depth to groundwater. Under the alkaline conditions present in southwestern soils, migration of inorganic and organic compounds will be limited and most constituents will remain fixed as soil precipitates or adsorbed on soil particles.

Table 5-1

Chemical Parameters Affecting Environmental Transport and Persistence
Williams Air Force Base

Compound	Log K_{ow}[a] (unitless)	K_{oc}[a] (mL/g)	H[a] (atm-m^3/mol)	Water Solubility[a] (mg/L)
Acetone	-0.24	0.28	4×10^{-5}	Infinitely Soluble
Benzene	2.13	65	5.43×10^{-3}	1,780
Bis(2-ethylhexyl)phthalate	5.11	62,000	2.50×10^{-7}	0.4
Chloroform	1.97	44	3.75×10^{-3}	8,220
Di-n-butyl phthalate	5.2[b]	6,400[c] to 170,000[d]	2.8×10^{-7}[d]	13[d] to 4,500
1,2-Dichlorobenzene	3.38	1,160	1.88×10^{-3}	100
1,4-Dichlorobenzene	3.39	1,180	1.58×10^{-3}	80
Ethyl benzene	3.15	1,100[d] to 682	7.90×10^{-3}	152
Methylene chloride	1.25	8.8	2.57×10^{-3}	13,200
Methyl ethyl ketone (2-Butanone)	0.29	34[c] to 0.94	4.35×10^{-5}	239,000[c] to 353,000
Phenol	1.46	14.2[d] to 148[c]	4.00×10^{-7}[c]	84,000
Pyrene	4.88[d]	38,000[d]	5.04×10^{-6}[d]	0.13[d]
Tetrachloroethene	3.14	210[c] to 665	2.27×10^{-2}	150
Toluene	2.73	259	6.61×10^{-3}	515
Xylenes	3.16	240[d] to 691	7.04×10^{-3}[d]	200[d]

[a]Unless otherwise noted, all data are from Oak Ridge National Laboratory, 1989.
[b]EPA, 1992, *Handbook of RCRA Ground-Water Monitoring Constituents: Chemical and Physical Properties* (40 CFR Part 264, App. 9), PB92-233287.
[c]Howard, P. H., 1990, *Handbook of Environmental Fate and Exposure Data for Organic Chemicals*, Vol. I and II, Lewis Publishers.
[d]EPA, 1986, *Superfund Public Health Evaluation Manual, EPA 540/1-86/060.*

6.0 Risk Assessment

6.1 Introduction

This section presents screening level risk assessments (SLRA) on six OU-5 sites where excavation was performed to remove areas of suspected contamination. No unacceptable risks should be present at the sites where removal actions were performed. Nevertheless, the SLRA was performed to determine if chemicals that remain require remedial action to protect human health and the environment. This risk assessment was performed as part of the RI initiated by the USAF under the IRP. The results of the assessment are used to determine the need for any remedial action and to establish a time frame to develop any required long-term alternatives. This risk assessment was conducted in accordance with the guidance documents, *Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A, Interim Final* (EPA, 1989) and *Region IX Preliminary Remediation Goals (PRG) First Half 1995* (EPA, 1995)

This section includes an SLRA on the following sites that are part of OU-5:

- Airfield USTs (ST-25)
- Paint Shop Leach Field (WP-27)
- Prime Beef Yard (SS-29)
- Golf Course Maintenance Area (SS-31)
- Munitions Incinerator (Facility 1119, SS-34)
- Concrete Hardfill Drum Removal Area (LF-26).

SLRAs were not performed on the Sewage Sludge Trenches Area (DP-28) because it was included in the final remedy with LF-4 in OU-1 (Section 3.5), nor on Building 1070, where evidence of the cited potentially contaminated area was not found (see Section 3.8).

The SLRAs were conducted in two phases:

- ***Phase I:*** The environmental sampling data collected during RI activities were reviewed and evaluated, and contaminants of potential concern (COPC) were identified.

- ***Phase II:*** Risk characterization, which consists of estimating conservative screening level risks for the COPCs identified in the Phase I based on methodology suggested in EPA (1995), was performed. Sites where risks exceed the upper bound of the acceptable cancer risk range (10^{-4}) (EPA, 1990), or a non-cancer hazard index (HI) of one, will be considered for further study under OU-4 (IT, 1995a).

Data validation procedures, summary statistics, and identification of COPCs are described in Section 6.2. Section 6.3 presents a brief exposure assessment section outlining the exposure scenario and exposure point concentrations. The risk characterization, Phase II of the SLRA, methodology, and results are described in Section 6.4. Overall uncertainties associated with the SLRA are discussed, qualitatively, in Section 6.5. This SLRA does not include a toxicity assessment section and a detailed exposure assessment found in traditional baseline type risk assessments because the SLRA uses the default exposure scenario and toxicity assessments included in the EPA (1995) methodology. When their default exposure scenario is used, these sections are not required.

6.2 Identification of Constituents of Potential Concern

Data collected during the RI were evaluated for use in the risk assessment in accordance with EPA guidelines. This process includes evaluating the sample collection and analytical methods used, evaluating the quality of the data, and comparing the data to EPA (1995) PRGs and to background. The purpose of this selection process is to first identify those constituents potentially harmful to human health if present at the site, then identify those constituents that are likely to be site-related and, lastly, evaluate the acceptability of the analytical data to be used in the quantitative risk assessment (EPA, 1989).

6.2.1 Data Sources

Background. The parties to the FFA agreed that it was necessary to establish Base-specific background levels for inorganic constituents in the surface soil as recommended in the OU-1 RI report (IT, 1992a). On this basis, background surface soil samples were collected and analyzed for inorganics. The OU-3 FSP addendum (IT, 1993c), and OU-1 RI work plan addendum (IT, 1993d) specified the exact locations and techniques that were approved by the FFA parties. Nine surface soil samples and a duplicate were collected and the analytical results were used to determine a Base-specific background concentration for each inorganic constituent. The background metals that were analyzed included antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

Site-Related. At the sites listed in Section 6.1 where excavations were performed, confirmatory soil samples were taken at the bottom and/or limits of an excavation. After excavation and sampling were completed, the excavated sites were backfilled with clean soil; therefore, subsurface soils were the only medium sampled. No soil samples were taken at

Building 1070 or DP-28 due to reasons noted in Section 6.1. Sample identification and analytical results for the excavated sites used in this SLRA are listed in Appendix A.

As noted in Section 2.2.3, it was assumed that there was no impact on groundwater, based on the nature and concentrations of contaminants detected at OU-5. Thus, no groundwater data were acquired.

6.2.2 Data Validation

Data validation is an after-the-fact, independent, systematic process of evaluating data and comparing them to pre-established criteria to confirm that the data are of acceptable technical quality. Specific criteria are reviewed to determine whether the data meet the stipulated data quality objectives. There are five principal quality objectives:

- Precision
- Accuracy
- Completeness
- Comparability
- Representativeness.

To verify that these objectives are met, field measurements, sampling and handling procedures, laboratory analysis and reporting, and nonconformances and discrepancies in the data are examined to determine compliance with appropriate and applicable procedures. The procedures and criteria for validation are defined in the RI/FS Data Validation Program Guidelines, which are based on the EPA National Functional Guidelines for Data Review (EPA 1988a, b).

The validation process for the OU-5 data was divided into two phases. The first phase considered field data to verify the completeness, accuracy, and representativeness of field sampling. The second phase dealt with analytical chemical validation. The key field data reviewed in the validation process are:

- Field Activity Daily Logs
- Sample Collection Logs
- Specific field forms for sample collection and handling
- Chain of Custody, Request for Analysis
- Field instrument calibrations
- Field personnel training
- Variances and surveillance of field activities.

The key analytical data reviewed in the validation process are:

- Organic chemicals:
  - Holding times and preservation
  - Gas chromatography/mass spectroscopy (GC/MS) performance
  - Initial and continuing instrument calibration
  - Surrogate recoveries
  - Matrix spike, matrix spike duplicates
  - Blank evaluation using the 5X/10X rule
  - Internal standards.

- Inorganic chemicals:

  - Holding times and preservation

  - Inductively coupled plasma (ICP), graphite furnace, and cold vapor atomic analysis instrument performance checks

  - Initial and continuing calibrations

  - Blank evaluations

  - Matrix spike evaluations

  - ICP serial dilution and interference checks

  - Laboratory control sample checks

  - Duplicate sample analysis

  - Furnace atomic absorption checks.

Organic chemicals are omitted from consideration if they are common laboratory contaminants and if all sample concentrations are less than ten times the highest blank concentration. Common laboratory contaminants include: acetone, 2-butanone, methylene chloride, toluene, and the phthalate esters. Other organic chemicals are eliminated if all analytical results are less than five times the highest concentration detected in a blank.

All environmental sampling data are evaluated for suitability for use in the risk assessment. Analytical results for constituents are reported using CLP data qualifiers. Constituents flagged with a "U" qualifier are considered to be not detected, or detected at a concentration below the normal, random "noise" of the analytical instrument. Estimated quantitative results such as those identified by a "J" qualifier are used in the assessment (EPA, 1989). The "J"

qualifier is the most encountered data qualifier in CLP data packages. Under the CLP, the "J" qualifier describes an estimated value when a compound is present (spectral identification criteria are met), but at values less than the contract-required quantitation limit, or when QC samples suggest that the sample results may be in error (e.g., when spike samples are outside of required limits or when holding times are slightly missed). If validation of the data reveal that samples must be rejected (assigned an "R" qualifier), the rejected data are not used for the SLRA.

6.2.3 Selection of Contaminants of Potential Concern

Once the data set is complete, summary statistics on site and background analytical data sets are compiled and source-term concentrations for all the chemicals are estimated. Chemicals are then eliminated from the list of COPCs based on the following criteria as recommended by the EPA (1989):

- ***Frequency of Detection.*** Constituents were eliminated if they were detected infrequently (5 percent or lower frequency of detection), providing there was no evidence that infrequent detection reflected a "hot spot" location.

- ***Risk-Based Screening.*** Compare source-term concentrations with the EPA (1995) PRGs for residential soil; chemicals are excluded from further consideration if their source-term concentrations are equal to or less than the PRGs.

- ***Background.*** If the mean of the site-influenced values were less than the mean of the background values, the chemicals were excluded from further considerations. If the mean of the site-influenced values were marginally greater than its background mean, a Students t-test was performed to determine if the former is statistically greater than the latter.

- ***Chemical Specificity.*** Analytical results that were not specific for a particular compound (e.g., gross alpha, gross beta, TPH, etc.) were excluded from further consideration.

6.2.4 Summary Statistics of Site-Related Data

The statistical methods used in data evaluation are discussed in this section, and reflect EPA headquarter guidance (EPA, 1989). The summary statistics on site-related data for the sites evaluated in this SLRA are listed in Table 6-1 through 6-6. A summary of the constituents analyzed at each site is presented in Table 3-1. For each set of data used to describe the concentration of contaminants in a medium, the following information was tabulated in the tables:

Table 6-1

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Airfield USTs (Site ST-25)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
Semivolatile Organics							
1,2,4-TRICHLOROBENZENE	0 - 2	NA	0.37 - 0.38	NA	6.20E+02	nc	No (a)
1,2-DICHLOROBENZENE	0 - 2	NA	0.37 - 0.38	NA	2.30E+03	sat	No (a)
1,3-DICHLOROBENZENE	0 - 2	NA	0.37 - 0.38	NA	2.80E+03	sat	No (a)
1,4-DICHLOROBENZENE	0 - 2	NA	0.37 - 0.38	NA	7.40E+00	c	No (a)
2,2'-OXYBIS(1-CHLOROPROPANE)	0 - 2	NA	0.37 - 0.38	NA	6.35E+00	c	No (a)
2,4,5-TRICHLOROPHENOL	0 - 2	NA	0.93 - 0.95	NA	6.50E+03	nc	No (a)
2,4,6-TRICHLOROPHENOL	0 - 2	NA	0.37 - 0.38	NA	4.00E+01	c	No (a)
2,4-DICHLOROPHENOL	0 - 2	NA	0.37 - 0.38	NA	2.00E+02	nc	No (a)
2,4-DIMETHYPHENOL	0 - 2	NA	0.37 - 0.38	NA	1.30E+03	nc	No (a)
2,4-DINITROPHENOL	0 - 2	NA	0.93 - 0.95	NA	1.30E+02	nc	No (a)
2,4-DINITROTOLUENE	0 - 2	NA	0.37 - 0.38	NA	1.30E+02	nc	No (a)
2,6-DINITROTOLUENE	0 - 2	NA	0.37 - 0.38	NA	6.50E+01	c	No (a)
2-CHLORONAPHTHALENE	0 - 2	NA	0.37 - 0.38	NA	5.21E+03	nc	No (a)
2-CHLOROPHENOL	0 - 2	NA	0.37 - 0.38	NA	3.30E+02	nc	No (a)
2-METHYLNAPHTHALENE	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
2-METHYLPHENOL	0 - 2	NA	0.37 - 0.38	NA	3.30E+03	nc	No (a)
2-NITROANILINE	0 - 2	NA	0.93 - 0.95	NA	3.90E+00	nc	No (a)
2-NITROPHENOL	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
3,3'-DICHLOROBENZIDINE	0 - 2	NA	0.37 - 0.38	NA	9.90E-01	c	No (a)
3-NITROANILINE	0 - 2	NA	0.93 - 0.95	NA	NA		No (a)
4,6-DINITRO-2-METHYLPHENOL	0 - 2	NA	0.93 - 0.95	NA	NA		No (a)
4-BROMOPHENYL-PHENYLETHER	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
4-CHLORO-3-METHYLPHENOL	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
4-CHLOROANILINE	0 - 2	NA	0.37 - 0.38	NA	2.60E+02	nc	No (a)
4-CHLOROPHENYL-PHENYLETHER	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
4-METHYLPHENOL	0 - 2	NA	0.37 - 0.38	NA	3.30E+02	nc	No (a)
4-NITROANILINE	0 - 2	NA	0.93 - 0.95	NA	NA		No (a)
4-NITROPHENOL	0 - 2	NA	0.93 - 0.95	NA	NA		No (a)

Table 6-1

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
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OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
ACENAPHTHENE	0 - 2	NA	0.37 - 0.38	NA	3.60E+02	sat	No (a)
ACENAPHTHYLENE	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
ANTHRACENE	0 - 2	NA	0.37 - 0.38	NA	1.90E+01	sat	No (a)
BENZO(A)ANTHRACENE	0 - 2	NA	0.37 - 0.38	NA	6.10E-01	c	No (a)
BENZO(A)PYRENE	0 - 2	NA	0.37 - 0.38	NA	6.10E-02	c	No (a)
BENZO(B)FLUORANTHENE	0 - 2	NA	0.37 - 0.38	NA	6.10E-01	c	No (a)
BENZO(G,H,I)PERYLENE	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
BENZO(K)FLUORANTHENE	0 - 2	NA	0.37 - 0.38	NA	6.10E+00	c	No (a)
BIS(2-CHLOROETHOXY)METHANE	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
BIS(2-CHLOROETHYL)ETHER	0 - 2	NA	0.37 - 0.38	NA	7.40E-02	c	No (a)
BIS(2-ETHYLHEXYL)PHTHALATE	0 - 2	NA	0.37 - 0.38	NA	3.20E+01	c	No (a)
BUTYLBENZYLPHTHALATE	0 - 2	NA	0.37 - 0.38	NA	1.30E+04	nc	No (a)
CARBAZOLE	0 - 2	NA	0.37 - 0.38	NA	2.20E+01	c	No (a)
CHRYSENE	0 - 2	NA	0.37 - 0.38	NA	2.40E+01	sat	No (a)
DI-N-BUTYLPHTHALATE	0 - 2	NA	0.37 - 0.38	NA	6.50E+03	nc	No (a)
DI-N-OCTYLPHTHALATE	0 - 2	NA	0.37 - 0.38	NA	1.30E+03	nc	No (a)
DIBENZ(A,H)ANTHRACENE	0 - 2	NA	0.37 - 0.38	NA	6.10E-02	c	No (a)
DIBENZOFURAN	0 - 2	NA	0.37 - 0.38	NA	2.60E+02	nc	No (a)
DIETHYLPHTHALATE	0 - 2	NA	0.37 - 0.38	NA	5.20E+04	nc	No (a)
DIMETHYLPHTHALATE	0 - 2	NA	0.37 - 0.38	NA	1.00E+05	max	No (a)
FLUORANTHENE	0 - 2	NA	0.37 - 0.38	NA	2.60E+03	nc	No (a)
FLUORENE	0 - 2	NA	0.37 - 0.38	NA	3.00E+02	sat	No (a)
HEXACHLOROBENZENE	0 - 2	NA	0.37 - 0.38	NA	2.80E-01	c	No (a)
HEXACHLOROBUTADIENE	0 - 2	NA	0.37 - 0.38	NA	5.70E+00	c	No (a)
HEXACHLOROETHANE	0 - 2	NA	0.37 - 0.38	NA	3.20E+01	nc	No (a)
INDENO(1,2,3-CD)PYRENE	0 - 2	NA	0.37 - 0.38	NA	6.10E-01	c	No (a)
ISOPHORONE	0 - 2	NA	0.37 - 0.38	NA	4.70E+02	c	No (a)
JP4 (BY MODIFIED 8015)	0 - 2	NA	2.2 - 2.3	NA	NA		No (c)
N-NITROSO-DI-N-PROPYLAMINE	0 - 2	NA	0.37 - 0.38	NA	6.30E-02	c	No (a)

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OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
N-NITROSODIPHENYLAMINE (1)	0 - 2	NA	0.37 - 0.38	NA	9.10E+01	c	No (a)
NAPHTHALENE	0 - 2	NA	0.37 - 0.38	NA	8.00E+02	sat	No (a)
NITROBENZENE	0 - 2	NA	0.37 - 0.38	NA	3.30E+01	nc	No (a)
PENTACHLOROPHENOL	0 - 2	NA	0.93 - 0.95	NA	2.50E+00	c	No (a)
PHENANTHRENE	0 - 2	NA	0.37 - 0.38	NA	NA		No (a)
PHENOL	0 - 2	NA	0.37 - 0.38	NA	3.90E+04	nc	No (a)
PYRENE	0 - 2	NA	0.37 - 0.38	NA	2.00E+03	nc	No (a)
Volatile Organics							
1,1,1-TRICHLOROETHANE	0 - 2	NA	0.011 - 0.011	NA	3.20E+03	nc	No (a)
1,1,2,2-TETRACHLOROETHANE	0 - 2	NA	0.011 - 0.011	NA	9.00E-01	c	No (a)
1,1,2-TRICHLOROETHANE	0 - 2	NA	0.011 - 0.011	NA	1.40E+00	c	No (a)
1,1-DICHLOROETHANE	0 - 2	NA	0.011 - 0.011	NA	8.40E+02	nc	No (a)
1,1-DICHLOROETHENE	0 - 2	NA	0.011 - 0.011	NA	3.80E-02	c	No (a)
1,2-DICHLOROETHANE	0 - 2	NA	0.011 - 0.011	NA	4.40E-01	c	No (a)
1,2-DICHLOROETHENE (TOTAL)	0 - 2	NA	0.011 - 0.011	NA	7.50E+01	nc	No (a)
1,2-DICHLOROPROPANE	0 - 2	NA	0.011 - 0.011	NA	6.80E-01	c	No (a)
2-BUTANONE	0 - 2	NA	0.011 - 0.011	NA	8.70E+03	nc	No (a)
2-HEXANONE	0 - 2	NA	0.011 - 0.011	NA	NA		No (a)
4-METHYL-2-PENTANONE	0 - 2	NA	0.011 - 0.011	NA	5.20E+03	nc	No (a)
ACETONE	0 - 2	NA	0.011 - 0.011	NA	2.00E+03	nc	No (a)
BENZENE	0 - 2	NA	0.011 - 0.011	NA	1.40E+00	c	No (a)
BROMODICHLOROMETHANE	0 - 2	NA	0.011 - 0.011	NA	1.40E+00	c	No (a)
BROMOFORM	0 - 2	NA	0.011 - 0.011	NA	5.60E+01	c	No (a)
BROMOMETHANE	0 - 2	NA	0.011 - 0.011	NA	1.50E+01	nc	No (a)
CARBON DISULFIDE	0 - 2	NA	0.011 - 0.011	NA	1.60E+01	nc	No (a)
CARBON TETRACHLORIDE	0 - 2	NA	0.011 - 0.011	NA	4.70E-01	c	No (a)
CHLOROBENZENE	0 - 2	NA	0.011 - 0.011	NA	1.60E+02	nc	No (a)
CHLOROETHANE	0 - 2	NA	0.011 - 0.011	NA	1.13E+03	sat	No (a)
CHL[illegible]FORM	0 - 2	NA	0.011 - 0.011	NA	5.30E-01	c	[illegible]a)

Table 6-1

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Airfield USTs (Site ST-25)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
CHLOROMETHANE	0 - 2	NA	0.011 - 0.011	NA	2.00E+00	c	No (a)
CIS-1,2-DICHLOROETHENE	0 - 2	NA	0.011 - 0.011	NA	5.90E+01	nc	No (a)
CIS-1,3-DICHLOROPROPENE	0 - 2	NA	0.011 - 0.011	NA	NA		No (a)
DIBROMOCHLOROMETHANE	0 - 2	NA	0.011 - 0.011	NA	5.30E+00	c	No (a)
ETHYLBENZENE	0 - 2	NA	0.011 - 0.011	NA	2.90E+03	sat	No (a)
M,P-XYLENE	0 - 2	NA	0.011 - 0.011	NA	9.80E+02	sat	No (a)
METHYLENE CHLORIDE	2 - 2	0.002 - 0.003	0.011 - 0.011	0.003	1.10E+01	c	No (b)
O-XYLENE	0 - 2	NA	0.011 - 0.011	NA	9.80E+02	sat	No (a)
STYRENE	0 - 2	NA	0.011 - 0.011	NA	2.20E+03	sat	No (a)
TETRACHLOROETHENE	0 - 2	NA	0.011 - 0.011	NA	7.00E+00	c	No (a)
TOLUENE	0 - 2	NA	0.011 - 0.011	NA	1.90E+03	nc	No (a)
TRANS-1,2-DICHLOROETHENE	0 - 2	NA	0.011 - 0.011	NA	1.70E+02	nc	No (a)
TRANS-1,3-DICHLOROPROPENE	0 - 2	NA	0.011 - 0.011	NA	NA		No (a)
TRICHLOROETHENE	0 - 2	NA	0.011 - 0.011	NA	7.10E+00	c	No (a)
VINYL CHLORIDE	0 - 2	NA	0.011 - 0.011	NA	5.20E-03	c	No (a)
XYLENE (TOTAL)	0 - 2	NA	0.011 - 0.011	NA	9.80E+02	sat	No (a)

NA = Not Applicable or Not Available
PRG = Preliminary Remediation Goals, EPA Region IX, 1995a.
c = cancer risk
nc = noncancer effect
sat = concentration at which chemicals soil absorptive and solubility limits have been reached
max = concentration >= 1E+05 mg/kg
COPC = Chemical of potential concern
No (a) = Not detected in any sample.
No (b) = Source-term concentration <= PRG.
No (c) = Not analyzed for specific compound

Table 6-2

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Paint Shop Leach Field (WP-27)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
Inorganics									
ARSENIC	3 - 3	5.9 - 9.6	0.7 - 0.72	7.73	9.6	3.20E-01	c	3.27	Yes
BERYLLIUM	2 - 3	0.43 - 0.49	0.23 - 0.24	0.35	0.49	1.40E-01	c	1.24	No (c)
CADMIUM	1 - 3	1.8 - 1.8	1.2 - 1.2	1.00	1.8	3.80E+01	n		No (b)
CHROMIUM	3 - 3	23.9 - 25.2	1.9 - 1.9	24.57	25.2	2.10E+02	c	20.28	No (b)
COPPER	3 - 3	32.5 - 61.1	1.4 - 1.4	47.23	61.1	2.80E+03	nc		No (b)
LEAD	3 - 3	18.2 - 18.5	0.47 - 0.48	18.33	18.5	4.00E+02	nc	15.26	No (b)
MERCURY	0 - 3	NA	0.12 - 0.12	NA	NA	2.30E+01	nc		No (a)
NICKEL	3 - 3	18 - 29.5	4.4 - 4.5	23.03	29.5	1.50E+03	nc	20.69	No (b)
SELENIUM	1 - 3	0.86 - 0.86	0.7 - 0.72	0.52	0.86	3.80E+02	nc	0.12	No (b)
SILVER	0 - 3	NA	1.6 - 1.7	NA	NA	3.80E+02	nc		No (a)
THALLIUM	1 - 3	1 - 1	0.7 - 0.72	0.57	1	6.10E+00 [a]	nc		No (b)
ZINC	3 - 3	86.5 - 149	0.93 - 0.95	119.17	149	2.30E+04			No (b)
Semivolatile Organics									
1,2,4-TRICHLOROBENZENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.20E+02	nc		No (a)
1,2-DICHLOROBENZENE	0 - 2	NA	0.39 - 0.4	NA	NA	2.30E+03	sat		No (a)
1,3-DICHLOROBENZENE	0 - 2	NA	0.39 - 0.4	NA	NA	2.80E+03	sat		No (a)
1,4-DICHLOROBENZENE	0 - 2	NA	0.39 - 0.4	NA	NA	7.40E+00	c		No (a)
2,2'-OXYBIS(1-CHLOROPROPANE)	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
2,4,5-TRICHLOROPHENOL	0 - 2	NA	0.97 - 0.99	NA	NA	6.50E+03	nc		No (a)
2,4,6-TRICHLOROPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	4.00E+01	c		No (a)
2,4-DICHLOROPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	2.00E+02	nc		No (a)
2,4-DIMETHYPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	1.30E+03	nc		No (a)
2,4-DINITROPHENOL	0 - 2	NA	0.97 - 0.99	NA	NA	1.30E+02	nc		No (a)
2,4-DINITROTOLUENE	0 - 2	NA	0.39 - 0.4	NA	NA	1.30E+02	nc		No (a)
2,6-DINITROTOLUENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.50E+01	c		No (a)
2-CHLORONAPHTHALENE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
2-CHLOROPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	3.30E+02	nc		No (a)
2-METHYLNAPHTHALENE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
2-METHYLPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	3.30E+03	nc		No (a)

Table 6-2

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Paint Shop Leach Field (WP-27)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
2-NITROANILINE	0 - 2	NA	0.97 - 0.99	NA	NA	3.90E+00	nc		No (a)
2-NITROPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
3,3'-DICHLOROBENZIDINE	0 - 2	NA	0.39 - 0.4	NA	NA	9.90E-01	c		No (a)
3-NITROANILINE	0 - 2	NA	0.97 - 0.99	NA	NA	NA			No (a)
4,6-DINITRO-2-METHYLPHENOL	0 - 2	NA	0.97 - 0.99	NA	NA	NA			No (a)
4-BROMOPHENYL-PHENYLETHER	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
4-CHLORO-3-METHYLPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
4-CHLOROANILINE	0 - 2	NA	0.39 - 0.4	NA	NA	2.60E+02	nc		No (a)
4-CHLOROPHENYL-PHENYLETHER	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
4-METHYLPHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	3.30E+02	nc		No (a)
4-NITROANILINE	0 - 2	NA	0.97 - 0.99	NA	NA	NA			No (a)
4-NITROPHENOL	0 - 2	NA	0.97 - 0.99	NA	NA	NA			No (a)
ACENAPHTHENE	0 - 2	NA	0.39 - 0.4	NA	NA	3.60E+02	sat		No (a)
ACENAPHTHYLENE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
ANTHRACENE	0 - 2	NA	0.39 - 0.4	NA	NA	1.90E+01	sat		No (a)
BENZO(A)ANTHRACENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.10E-01	c		No (a)
BENZO(A)PYRENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.10E-02	c		No (a)
BENZO(B)FLUORANTHENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.10E-01	c		No (a)
BENZO(G,H,I)PERYLENE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
BENZO(K)FLUORANTHENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.10E+00	c		No (a)
BIS(2-CHLOROETHOXY)METHANE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
BIS(2-CHLOROETHYL)ETHER	0 - 2	NA	0.39 - 0.4	NA	NA	7.40E-02	c		No (a)
BIS(2-ETHYLHEXYL)PHTHALATE	0 - 2	NA	0.39 - 0.4	NA	NA	3.20E+01	c		No (a)
BUTYL BENZYL PHTHALATE	0 - 2	NA	0.39 - 0.4	NA	NA	1.30E+04	nc		No (a)
CARBAZOLE	0 - 2	NA	0.39 - 0.4	NA	NA	2.20E+01	c		No (a)
CHRYSENE	0 - 2	NA	0.39 - 0.4	NA	NA	2.40E+01	sat		No (a)
DI-N-BUTYL PHTHALATE	0 - 2	NA	0.39 - 0.4	NA	NA	6.50E+03	nc		No (a)
DI-N-OCTYL PHTHALATE	0 - 2	NA	0.39 - 0.4	NA	NA	1.30E+03	nc		No (a)
DIBENZ(A,H)ANTHRACENE	0 - 2	NA	0.39 - 0.4	NA	NA	6.10E-02	c		No (a)
DIBENZOFURAN	0 - 2	NA	0.39 - 0.4	NA	NA	2.60E+02	nc		No (a)
DIESEL RANGE ORGANICS	0 - 2	NA	5.8 - 6	NA	NA				No (a)

Table 6-2

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Paint Shop Leach Field (WP-27)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
DIETHYL PHTHALATE	0 - 2	NA	0.39 - 0.4	NA	NA	5.20E+04	nc		No (a)
DIMETHYL PHTHALATE	0 - 2	NA	0.39 - 0.4	NA	NA	1.00E+05	max		No (a)
FLUORANTHENE	0 - 2	NA	0.39 - 0.4	NA	NA	2.60E+03	nc		No (a)
FLUORENE	0 - 2	NA	0.39 - 0.4	NA	NA	3.00E+02	sat		No (a)
HEXACHLOROBENZENE	0 - 2	NA	0.39 - 0.4	NA	NA	2.80E-01	c		No (a)
HEXACHLOROBUTADIENE	0 - 1	NA	0.39 - 0.39	NA	NA	5.70E+00	c		No (a)
HEXACHLOROCYCLOPENTADIENE	0 - 1	NA	0.4 - 0.4	NA	NA	3.20E+01	nc		No (a)
HEXACHLOROETHANE	0 - 2	NA	0.39 - 0.4	NA	NA	6.10E-01	c		No (a)
INDENO(1,2,3-CD)PYRENE	0 - 2	NA	0.39 - 0.4	NA	NA	4.70E+02	c		No (a)
ISOPHORONE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
N-NITROSO-DI-N-PROPYLAMINE	0 - 2	NA	0.39 - 0.4	NA	NA	6.30E-02	c		No (a)
N-NITROSODIPHENYLAMINE (1)	0 - 2	NA	0.39 - 0.4	NA	NA	9.10E+01	c		No (a)
NAPHTHALENE	0 - 2	NA	0.39 - 0.4	NA	NA	8.00E+02	sat		No (a)
NITROBENZENE	0 - 2	NA	0.39 - 0.4	NA	NA	3.30E+01	nc		No (a)
PENTACHLOROPHENOL	0 - 2	NA	0.97 - 0.99	NA	NA	2.50E+00	c		No (a)
PHENANTHRENE	0 - 2	NA	0.39 - 0.4	NA	NA	NA			No (a)
PHENOL	0 - 2	NA	0.39 - 0.4	NA	NA	3.90E+04	nc		No (a)
PYRENE	0 - 2	NA	0.39 - 0.4	NA	NA	2.00E+03	nc		No (a)

[a] PRG for thallium sulfate is used for thallium.

NA = Not applicable or not available
PRG = Preliminary remediation goals, EPA Region IX, 1995.
c = Cancer risk.
nc = Noncancer effect.
sat = Concentration at which chemicals soil absorptive and solubility limits have been reached.
max = Concentration >= 1E+05 mg/kg.
COPC = Chemical of potential concern.
No (a) = Not detected in any sample.
No (b) = Source-term concentration <= PRG.
No (c) = Mean concentration <= mean of background.

Table 6-3

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Prime Beef Yard (SS-29)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
Inorganics									
ARSENIC	3 / 3	5.2 - 6.3	0.66 - 0.69	5.57	6.3	3.20E-01	c	3.27	Yes
BERYLLIUM	0 / 3	NA	0.22 - 0.23	NA	NA	1.40E-01	c		No (a)
CADMIUM	0 / 3	NA	1.1 - 1.1	NA	NA	3.80E+01	nc		No (a)
CHROMIUM	3 / 3	28.1 - 35.2	1.8 - 1.8	30.97	35.2	2.10E+02	c	20.28	No (b)
COPPER	3 / 3	79.5 - 155	1.3 - 1.4	112.17	155	2.80E+03	nc		No (b)
LEAD	3 / 3	20.8 - 22.6	0.44 - 0.46	21.60	22.6	4.00E+02	nc	15.26	No (b)
MERCURY	0 / 3	NA	0.11 - 0.11	NA	NA	2.30E+01	nc		No (a)
NICKEL	3 / 3	24.4 - 30.1	4.2 - 4.4	27.87	30.1	1.50E+03	nc	20.69	No (b)
SELENIUM	2 / 3	0.9 - 1.7	0.66 - 0.69	0.98	1.7	3.80E+02	nc	0.12	No (b)
SILVER	0 / 3	NA	1.5 - 1.6	NA	NA	3.80E+02	nc		No (a)
THALLIUM	2 / 3	0.92 - 1.1	0.66 - 0.69	0.78	1.1	6.10E+00 [a]	nc		No (b)
ZINC	3 / 3	164 - 232	0.88 - 0.92	198.67	232	2.30E+04	nc		No (b)
Pesticides/PCBs									
4,4'-DDD	0 / 2	NA	0.0036 - 0.0038	NA	NA	1.90E+00	c	NA	No (a)
4,4'-DDE	0 / 2	NA	0.0036 - 0.0038	NA	NA	1.30E+00	c	NA	No (a)
4,4'-DDT	0 / 2	NA	0.0036 - 0.0038	NA	NA	1.30E+00	c	NA	No (a)
ALDRIN	0 / 2	NA	0.0019 - 0.0019	NA	NA	2.60E-02	c	NA	No (a)
ALPHA-BHC	0 / 2	NA	0.0019 - 0.0019	NA	NA	7.10E-02	c	NA	No (a)
ALPHA-CHLORDANE	0 / 2	NA	0.0019 - 0.0019	NA	NA	NA		NA	No (a)
AROCLOR-1016	0 / 2	NA	0.036 - 0.038	NA	NA	4.90E+00	nc	NA	No (a)
AROCLOR-1221	0 / 2	NA	0.073 - 0.076	NA	NA	6.60E-02	c	NA	No (a)
AROCLOR-1232	0 / 2	NA	0.036 - 0.038	NA	NA	6.60E-02	c	NA	No (a)
AROCLOR-1242	0 / 2	NA	0.036 - 0.038	NA	NA	6.60E-02	c	NA	No (a)
AROCLOR-1248	0 / 2	NA	0.036 - 0.038	NA	NA	6.60E-02	c	NA	No (a)
AROCLOR-1254	0 / 2	NA	0.036 - 0.038	NA	NA	1.40E+00	nc	NA	No (a)
AROCLOR-1260	0 / 2	NA	0.036 - 0.038	NA	NA	6.60E-02	c	NA	No (a)
BETA-BHC	0 / 2	NA	0.0019 - 0.0019	NA	NA	2.50E-01	c	NA	No (a)
DELTA-BHC	0 / 2	NA	0.0019 - 0.0019	NA	NA	NA		NA	No (a)
DIELDRIN	0 / 2	NA	0.0036 - 0.0038	NA	NA	2.80E-02	c	NA	No (a)
ENDOSULFAN I	0 / 2	NA	0.0019 - 0.0019	NA	NA	NA		NA	No (a)
ENDOSULFAN II	0 / 2	NA	0.0036 - 0.0038	NA	NA	NA		NA	No (a)

Table 6-3

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Prime Beef Yard (SS-29)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
ENDOSULFAN SULFATE	0 / 2	NA	0.0036 - 0.0038	NA	NA	NA		NA	No (a)
ENDRIN	0 / 2	NA	0.0036 - 0.0038	NA	NA	2.00E+01	nc	NA	No (a)
ENDRIN ALDEHYDE	0 / 2	NA	0.0036 - 0.0038	NA	NA	NA		NA	No (a)
ENDRIN KETONE	0 / 2	NA	0.0036 - 0.0038	NA	NA	NA		NA	No (a)
GAMMA-BHC (LINDANE)	0 / 2	NA	0.0019 - 0.0019	NA	NA	3.40E-01	c	NA	No (a)
GAMMA-CHLORDANE	0 / 2	NA	0.0019 - 0.0019	NA	NA	NA		NA	No (a)
HEPTACHLOR	0 / 2	NA	0.0019 - 0.0019	NA	NA	9.90E-02	c	NA	No (a)
HEPTACHLOR EPOXIDE	0 / 2	NA	0.0019 - 0.0019	NA	NA	4.90E-02	c	NA	No (a)
METHOXYCHLOR	0 / 2	NA	0.019 - 0.019	NA	NA	3.30E-02	nc	NA	No (a)
TOXAPHENE	0 / 2	NA	0.19 - 0.19	NA	NA	4.00E-01	c	NA	No (a)
Semivolatile Organics									
1,2,4-TRICHLOROBENZENE	0 / 3	NA	0.36 - 0.38	NA	NA	6.20E+02	nc	NA	No (a)
1,2-DICHLOROBENZENE	0 / 3	NA	0.36 - 0.38	NA	NA	2.30E+03	sat	NA	No (a)
1,3-DICHLOROBENZENE	0 / 3	NA	0.36 - 0.38	NA	NA	2.80E+03	sat	NA	No (a)
1,4-DICHLOROBENZENE	0 / 3	NA	0.36 - 0.38	NA	NA	7.40E+00	c	NA	No (a)
2,2'-OXYBIS(1-CHLOROPROPANE)	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
2,4,5-TRICHLOROPHENOL	0 / 3	NA	0.91 - 0.95	NA	NA	6.50E+03	nc	NA	No (a)
2,4,6-TRICHLOROPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	4.00E+01	c	NA	No (a)
2,4-DICHLOROPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	2.00E+02	nc	NA	No (a)
2,4-DIMETHYPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	1.30E+03	nc	NA	No (a)
2,4-DINITROPHENOL	0 / 3	NA	0.91 - 0.95	NA	NA	1.30E+02	nc	NA	No (a)
2,4-DINITROTOLUENE	0 / 3	NA	0.36 - 0.38	NA	NA	1.30E+02	nc	NA	No (a)
2,6-DINITROTOLUENE	0 / 3	NA	0.36 - 0.38	NA	NA	6.50E+01	c	NA	No (a)
2-CHLORONAPHTHALENE	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
2-CHLOROPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	3.30E+02	nc	NA	No (a)
2-METHYLNAPHTHALENE	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
2-METHYLPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	3.30E+03	nc	NA	No (a)
2-NITROANILINE	0 / 3	NA	0.91 - 0.95	NA	NA	3.90E+00	nc	NA	No (a)
2-NITROPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
3,3'-DICHLOROBENZIDINE	0 / 3	NA	0.36 - 0.38	NA	NA	9.90E-01	c	NA	No (a)
3-NITROANILINE	0 / 3	NA	0.91 - 0.95	NA	NA	NA		NA	No (a)
4,6-DINITRO-2-METHYLPHENOL	0 / 3	NA	0.91 - 0.95	NA	NA	NA		NA	No (a)

Table 6-3

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Prime Beef Yard (SS-29)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
4-BROMOPHENYL-PHENYLETHER	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
4-CHLORO-3-METHYLPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
4-CHLOROANILINE	0 / 3	NA	0.36 - 0.38	NA	NA	2.60E+02	nc	NA	No (a)
4-CHLOROPHENYL-PHENYLETHEF	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
4-METHYLPHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	3.30E+02	nc	NA	No (a)
4-NITROANILINE	0 / 3	NA	0.91 - 0.95	NA	NA	NA		NA	No (a)
4-NITROPHENOL	0 / 3	NA	0.91 - 0.95	NA	NA	NA		NA	No (a)
ACENAPHTHENE	0 / 3	NA	0.38 - 0.38	NA	NA	3.60E+02	sat	NA	No (a)
ACENAPHTHYLENE	0 / 3	NA	0.38 - 0.38	NA	NA	NA		NA	No (a)
ANTHRACENE	0 / 3	NA	0.38 - 0.38	NA	NA	1.90E+01	sat	NA	No (a)
BENZO(A)ANTHRACENE	0 / 3	NA	0.38 - 0.38	NA	NA	6.10E-01	c	NA	No (a)
BENZO(A)PYRENE	0 / 3	NA	0.38 - 0.38	NA	NA	6.10E-02	c	NA	No (a)
BENZO(B)FLUORANTHENE	0 / 3	NA	0.38 - 0.38	NA	NA	6.10E-01	c	NA	No (a)
BENZO(G,H,I)PERYLENE	0 / 3	NA	0.38 - 0.38	NA	NA	NA		NA	No (a)
BENZO(K)FLUORANTHENE	0 / 3	NA	0.38 - 0.38	NA	NA	6.10E+00	c	NA	No (a)
BIS(2-CHLOROETHOXY)METHANE	0 / 3	NA	0.38 - 0.38	NA	NA	NA		NA	No (a)
BIS(2-CHLOROETHYL)ETHER	0 / 3	NA	0.38 - 0.38	NA	NA	7.40E-02	c	NA	No (a)
BIS(2-ETHYLHEXYL)PHTHALATE	0 / 3	NA	0.38 - 0.38	NA	NA	3.20E+01	c	NA	No (a)
BUTYL BENZYL PHTHALATE	0 / 3	NA	0.38 - 0.38	NA	NA	1.30E+04	nc	NA	No (a)
CARBAZOLE	0 / 3	NA	0.36 - 0.38	NA	NA	2.20E+01	c	NA	No (a)
CHRYSENE	0 / 3	NA	0.36 - 0.38	NA	NA	2.40E+01	sat	NA	No (a)
DI-N-BUTYL PHTHALATE	0 / 3	NA	0.36 - 0.38	NA	NA	6.50E+03	nc	NA	No (a)
DI-N-OCTYL PHTHALATE	0 / 3	NA	0.36 - 0.38	NA	NA	1.30E+03	nc	NA	No (a)
DIBENZ(A,H)ANTHRACENE	0 / 3	NA	0.36 - 0.38	NA	NA	6.10E-02	c	NA	No (a)
DIBENZOFURAN	0 / 3	NA	0.36 - 0.38	NA	NA	2.60E+02	nc	NA	No (a)
DIESEL RANGE ORGANICS	0 / 3	NA	5.5 - 5.8	NA	NA	NA		NA	No (a)
DIETHYL PHTHALATE	0 / 3	NA	0.36 - 0.38	NA	NA	5.20E+04	nc	NA	No (a)
DIMETHYL PHTHALATE	0 / 3	NA	0.36 - 0.38	NA	NA	1.00E+05	max	NA	No (a)
FLUORANTHENE	0 / 3	NA	0.36 - 0.38	NA	NA	2.60E+03	nc	NA	No (a)
FLUORENE	0 / 3	NA	0.36 - 0.38	NA	NA	3.00E+02	sat	NA	No (a)
HEXACHLOROBENZENE	0 / 3	NA	0.36 - 0.38	NA	NA	2.80E-01	c	NA	No (a)
HEXACHLOROBUTADIENE	0 / 2	NA	0.36 - 0.38	NA	NA	5.70E+00	c	NA	No (a)

Table 6-3

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Prime Beef Yard (SS-29)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
HEXACHLOROCYCLOPENTADIENE	0 / 1	NA	0.38 - 0.38	NA	NA	4.50E+02	nc	NA	No (a)
HEXACHLOROETHANE	0 / 3	NA	0.36 - 0.38	NA	NA	3.20E+01	nc	NA	No (a)
INDENO(1,2,3-CD)PYRENE	0 / 3	NA	0.36 - 0.38	NA	NA	6.10E-01	c	NA	No (a)
ISOPHORONE	0 / 3	NA	0.36 - 0.38	NA	NA	4.70E+02	c	NA	No (a)
N-NITROSO-DI-N-PROPYLAMINE	0 / 3	NA	0.36 - 0.38	NA	NA	6.30E-02	c	NA	No (a)
N-NITROSODIPHENYLAMINE (1)	0 / 3	NA	0.36 - 0.38	NA	NA	9.10E+01	c	NA	No (a)
NAPHTHALENE	0 / 3	NA	0.36 - 0.38	NA	NA	8.00E+02	sat	NA	No (a)
NITROBENZENE	0 / 3	NA	0.36 - 0.38	NA	NA	3.30E+01	nc	NA	No (a)
PENTACHLOROPHENOL	0 / 3	NA	0.91 - 0.95	NA	NA	2.50E+00	c	NA	No (a)
PHENANTHRENE	0 / 3	NA	0.36 - 0.38	NA	NA	NA		NA	No (a)
PHENOL	0 / 3	NA	0.36 - 0.38	NA	NA	3.90E+04	nc	NA	No (a)
PYRENE	0 / 3	NA	0.36 - 0.38	NA	NA	2.00E+03	nc	NA	No (a)
Volatile Organics									
1,1,1-TRICHLOROETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	3.20E+03	nc	NA	No (a)
1,1,2,2-TETRACHLOROETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	9.00E-01	c	NA	No (a)
1,1,2-TRICHLOROETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	1.40E+00	c	NA	No (a)
1,1-DICHLOROETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	8.40E+02	nc	NA	No (a)
1,1-DICHLOROETHENE	0 / 3	NA	0.011 - 0.011	NA	NA	3.80E-02	c	NA	No (a)
1,2-DICHLOROETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	4.40E-01	c	NA	No (a)
1,2-DICHLOROETHENE (TOTAL)	0 / 3	NA	0.011 - 0.011	NA	NA	7.50E+01	nc	NA	No (a)
1,2-DICHLOROPROPANE	0 / 3	NA	0.011 - 0.011	NA	NA	6.80E-01	c	NA	No (a)
2-BUTANONE	0 / 3	NA	0.011 - 0.011	NA	NA	8.70E+03	nc	NA	No (a)
2-HEXANONE	0 / 3	NA	0.011 - 0.011	NA	NA	NA		NA	No (a)
4-METHYL-2-PENTANONE	0 / 3	NA	0.011 - 0.011	NA	NA	5.20E+03	nc	NA	No (a)
ACETONE	0 / 3	NA	0.011 - 0.011	NA	NA	2.00E+03	nc	NA	No (a)
BENZENE	0 / 3	NA	0.011 - 0.011	NA	NA	1.40E+00	c	NA	No (a)
BROMODICHLOROMETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	1.40E+00	c	NA	No (a)
BROMOFORM	0 / 3	NA	0.011 - 0.011	NA	NA	5.60E+01	c	NA	No (a)
BROMOMETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	1.50E+01	nc	NA	No (a)
CARBON DISULFIDE	0 / 3	NA	0.011 - 0.011	NA	NA	1.60E+01	nc	NA	No (a)
CARBON TETRACHLORIDE	0 / 3	NA	0.011 - 0.011	NA	NA	4.70E-01	c	NA	No (a)
CHLOROBENZENE	0 / 3	NA	0.011 - 0.011	NA	NA	1.60E+02	nc	NA	No (a)

Table 6-3

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Prime Beef Yard (SS-29)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
CHLOROETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	NA		NA	No (a)
CHLOROFORM	0 / 3	NA	0.011 - 0.011	NA	NA	5.30E-01	c	NA	No (a)
CHLOROMETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	2.00E+00	c	NA	No (a)
CIS-1,2-DICHLOROETHENE	0 / 3	NA	0.011 - 0.011	NA	NA	5.90E+01	nc	NA	No (a)
CIS-1,3-DICHLOROPROPENE	0 / 3	NA	0.011 - 0.011	NA	NA	NA		NA	No (a)
DIBROMOCHLOROMETHANE	0 / 3	NA	0.011 - 0.011	NA	NA	5.30E+00	c	NA	No (a)
ETHYL BENZENE	0 / 3	NA	0.011 - 0.011	NA	NA	2.90E+03	sat	NA	No (a)
M,P-XYLENE	0 / 3	NA	0.011 - 0.011	NA	NA	9.80E+02	sat	NA	No (a)
METHYLENE CHLORIDE	1 / 3	0.004 - 0.004	0.011 - 0.011	0.01	0.004	1.10E+01	c	NA	No (b)
O-XYLENE	0 / 3	NA	0.011 - 0.011	NA	NA	9.80E+02	sat	NA	No (a)
STYRENE	0 / 3	NA	0.011 - 0.011	NA	NA	2.20E+03	sat	NA	No (a)
TETRACHLOROETHENE	0 / 3	NA	0.011 - 0.011	NA	NA	7.00E+00	c	NA	No (a)
TOLUENE	0 / 3	NA	0.011 - 0.011	NA	NA	1.90E+03	nc	NA	No (a)
TRANS-1,2-DICHLOROETHENE	0 / 3	NA	0.011 - 0.011	NA	NA	1.70E+02	nc	NA	No (a)
TRANS-1,3-DICHLOROPROPENE	0 / 3	NA	0.011 - 0.011	NA	NA	NA		NA	No (a)
TRICHLOROETHENE	0 / 3	NA	0.011 - 0.011	NA	NA	7.10E+00	c	NA	No (a)
VINYL CHLORIDE	0 / 3	NA	0.011 - 0.011	NA	NA	5.20E-03	c	NA	No (a)
XYLENE (TOTAL)	0 / 3	NA	0.011 - 0.011	NA	NA	9.80E+02	sat	NA	No (a)

[a] PRG for thallium sulfate is used for thallium.

NA = Not applicable or not available
PRG = Preliminary remediation goals, EPA Region IX, 1995.
c = Cancer risk.
nc = Noncancer effect.
sat = Concentration at which chemicals soil absorptive and solubility limits have been reached.
max = Concentration >= 1E+05 mg/kg.
COPC = Chemical of potential concern.
No (a) = Not detected in any sample.
No (b) = Source-term concentration <= PRG.
No (c) = Mean concentration <= mean of background.

Table 6-4

Statistical Summary and COPC Selection for 1995 Subsurface Soil Samples
Golf Course Maintenance Area (Site SS-31)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
Semivolatile Organics							
1,2,4-TRICHLOROBENZENE	0 / 2	NA	0.185 - 0.19	NA	6.20E+02	nc	No(a)
1,2-DICHLOROBENZENE	0 / 2	NA	0.185 - 0.19	NA	2.30E+03	sat	No(a)
1,3-DICHLOROBENZENE	0 / 2	NA	0.185 - 0.19	NA	2.80E+03	sat	No(a)
1,4-DICHLOROBENZENE	0 / 2	NA	0.185 - 0.19	NA	7.40E+00	c	No(a)
2,2'-OXYBIS(1-CHLOROPROPANE)	0 / 2	NA	0.19 - 0.47	NA	6.35E+00	c	No(a)
2,4,5-TRICHLOROPHENOL	0 / 2	NA	0.185 - 0.475	NA	6.50E+03	nc	No(a)
2,4,6-TRICHLOROPHENOL	0 / 2	NA	0.185 - 0.19	NA	4.00E+01	c	No(a)
2,4-DICHLOROPHENOL	0 / 2	NA	0.185 - 0.19	NA	2.00E+02	nc	No(a)
2,4-DIMETHYPHENOL	0 / 2	NA	0.19 - 0.47	NA	1.30E+03	nc	No(a)
2,4-DINITROPHENOL	0 / 2	NA	0.185 - 0.475	NA	1.30E+02	nc	No(a)
2,4-DINITROTOLUENE	0 / 2	NA	0.185 - 0.19	NA	1.30E+02	nc	No(a)
2,6-DINITROTOLUENE	0 / 2	NA	0.185 - 0.19	NA	6.50E+01	c	No(a)
2-CHLORONAPHTHALENE	0 / 2	NA	0.185 - 0.19	NA	5.21E+03	nc	No(a)
2-CHLOROPHENOL	0 / 2	NA	0.185 - 0.19	NA	3.30E+02	nc	No(a)
2-METHYLNAPHTHALENE	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
2-METHYLPHENOL	0 / 2	NA	0.19 - 0.47	NA	3.30E+03	nc	No(a)
2-NITROANILINE	0 / 2	NA	0.185 - 0.475	NA	3.90E+00	nc	No(a)
2-NITROPHENOL	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
3,3'-DICHLOROBENZIDINE	0 / 2	NA	0.19 - 0.47	NA	9.90E-01	c	No(a)
3-NITROANILINE	0 / 2	NA	0.47 - 0.475	NA	NA		No(a)
4,6-DINITRO-2-METHYLPHENOL	0 / 2	NA	0.185 - 0.475	NA	NA		No(a)
4-BROMOPHENYL-PHENYLETHER	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
4-CHLORO-3-METHYLPHENOL	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
4-CHLOROANILINE	0 / 2	NA	0.185 - 0.19	NA	2.60E+02	nc	No(a)
4-CHLOROPHENYL-PHENYLETHER	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
4-METHYLPHENOL	0 / 2	NA	0.19 - 0.47	NA	3.30E+02	nc	No(a)
4-NITROANILINE	0 / 2	NA	0.47 - 0.475	NA	NA		No(a)
4-NITROPHENOL	0 / 2	NA	0.185 - 0.475	NA	NA		No(a)
ACENAPHTHENE	0 / 2	NA	0.185 - 0.19	NA	3.60E+02	sat	No(a)

Table 6-4

Statistical Summary and COPC Selection for 1995 Subsurface Soil Samples
Golf Course Maintenance Area (Site SS-31)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
ACENAPHTHYLENE	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
ANTHRACENE	0 / 2	NA	0.185 - 0.19	NA	1.90E+01	sat	No(a)
BENZO(A)ANTHRACENE	0 / 2	NA	0.185 - 0.19	NA	6.10E-01	c	No(a)
BENZO(A)PYRENE	0 / 2	NA	0.185 - 0.19	NA	6.10E-02	c	No(a)
BENZO(B)FLUORANTHENE	0 / 2	NA	0.185 - 0.19	NA	6.10E-01	c	No(a)
BENZO(G,H,I)PERYLENE	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
BENZO(K)FLUORANTHENE	0 / 2	NA	0.185 - 0.19	NA	6.10E+00	c	No(a)
BIS(2-CHLOROETHOXY)METHANE	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
BIS(2-CHLOROETHYL)ETHER	0 / 2	NA	0.185 - 0.19	NA	7.40E-02	c	No(a)
BIS(2-ETHYLHEXYL)PHTHALATE	0 / 2	NA	0.185 - 0.19	NA	3.20E+01	c	No(a)
BUTYLBENZYLPHTHALATE	0 / 2	NA	0.185 - 0.19	NA	1.30E+04	nc	No(a)
CARBAZOLE	0 / 2	NA	0.185 - 0.19	NA	2.20E+01	c	No(a)
CHRYSENE	0 / 2	NA	0.185 - 0.19	NA	2.40E+01	sat	No(a)
DI-N-BUTYLPHTHALATE	0 / 2	NA	0.185 - 0.19	NA	6.50E+03	nc	No(a)
DI-N-OCTYLPHTHALATE	0 / 2	NA	0.185 - 0.19	NA	1.30E+03	nc	No(a)
DIBENZ(A,H)ANTHRACENE	0 / 2	NA	0.185 - 0.19	NA	6.10E-02	c	No(a)
DIBENZOFURAN	0 / 2	NA	0.19 - 2.8	NA	2.60E+02	nc	No(a)
DIESEL RANGE ORGANICS	0 / 2	NA	0.185 - 2.85	NA	NA		No(a)
DIETHYLPHTHALATE	0 / 2	NA	0.185 - 0.19	NA	5.20E+04	nc	No(a)
DIMETHYLPHTHALATE	0 / 2	NA	0.185 - 0.19	NA	1.00E+05	max	No(a)
FLUORANTHENE	0 / 2	NA	0.185 - 0.19	NA	2.60E+03	nc	No(a)
FLUORENE	0 / 2	NA	0.185 - 0.19	NA	3.00E+02	sat	No(a)
HEXACHLOROBENZENE	0 / 2	NA	0.185 - 0.19	NA	2.80E-01	c	No(a)
HEXACHLOROBUTADIENE	0 / 2	NA	0.185 - 0.19	NA	5.70E+00	c	No(a)
HEXACHLOROETHANE	0 / 2	NA	0.185 - 0.19	NA	3.20E+01	nc	No(a)
INDENO(1,2,3-CD)PYRENE	0 / 2	NA	0.185 - 0.19	NA	6.10E-01	c	No(a)
ISOPHORONE	0 / 2	NA	0.185 - 0.19	NA	4.70E+02	c	No(a)
N-NITROSO-DI-N-PROPYLAMINE	0 / 2	NA	0.185 - 0.19	NA	6.30E-02	c	No(a)
N-NITROSODIPHENYLAMINE (1)	0 / 2	NA	0.185 - 0.19	NA	9.10E+01	c	No(a)
NAPHTHALENE	0 / 2	NA	0.185 - 0.19	NA	8.00E+02	sat	No(a)

Table 6-4

Statistical Summary and COPC Selection for 1995 Subsurface Soil Samples
Golf Course Maintenance Area (Site SS-31)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
NITROBENZENE	0 / 2	NA	0.19 - 0.47	NA	3.30E+01	nc	No(a)
PENTACHLOROPHENOL	0 / 2	NA	0.185 - 0.475	NA	2.50E+00	c	No(a)
PHENANTHRENE	0 / 2	NA	0.185 - 0.19	NA	NA		No(a)
PHENOL	0 / 2	NA	0.185 - 0.19	NA	3.90E+04	nc	No(a)
PYRENE	0 / 2	NA	0.19 - 0.19	NA	2.00E+03	nc	No(a)

NA = Not Applicable or Not Available
PRG = Preliminary Remediation Goals, EPA Region IX, 1995a.
c = cancer risk
nc = noncancer effect
sat = concentration at which chemicals soil absorptive and solubility limits have been reached
max = concentration >= 1E+05 mg/kg
COPC = Chemical of potential concern
No (a) = Not detected in any sample.

Table 6-5

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Munitions Incinerator (Facility 1119, SS-34)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
Inorganics									
ARSENIC	2 - 2	5.3 - 5.8	0.63 - 0.64	5.55	5.8	3.20E-01	c	3.27	Yes
BERYLLIUM	1 - 2	0.65 - 0.65	0.21 - 0.21	0.38	0.65	1.40E-01	c	1.24	No (c)
CADMIUM	0 - 2	NA	1.1 - 1.1	NA	NA	3.80E+01	nc		No (a)
CHROMIUM	2 - 2	22.1 - 23.9	1.7 - 1.7	23.00	23.9	2.10E+02	c	20.28	No (b)
COPPER	2 - 2	28.5 - 32.4	1.3 - 1.3	30.45	32.4	2.80E+03	nc		No (b)
LEAD	2 - 2	16.6 - 16.7	0.42 - 0.43	16.65	16.7	4.00E+02	nc	15.26	No (b)
MERCURY	0 - 2	NA	0.11 - 0.11	NA	NA	2.30E+01	nc		No (a)
NICKEL	2 - 2	18.8 - 21.5	4 - 4	20.15	21.5	1.50E+03	nc	20.69	No (b)
SELENIUM	2 - 2	0.86 - 1.5	0.63 - 0.64	1.18	1.5	3.80E+02	nc	0.12	No (b)
SILVER	0 - 2	NA	1.5 - 1.5	NA	NA	3.80E+01	nc		No (a)
THALLIUM	2 - 2	0.99 - 1.5	0.63 - 0.64	1.25	1.5	6.10E+00 [a]	nc		No (b)
ZINC	2 - 2	78.8 - 84.8	0.84 - 0.85	81.80	84.8	2.30E+04	nc		No (b)
Pesticides/PCBs									
4,4'-DDD	0 - 2	NA	0.0035 - 0.0035	NA	NA	1.90E+00	c		No (a)
4,4'-DDE	0 - 2	NA	0.0035 - 0.0035	NA	NA	1.30E+00	c		No (a)
4,4'-DDT	0 - 2	NA	0.0035 - 0.0035	NA	NA	1.30E+00	c		No (a)
ALDRIN	0 - 2	NA	0.0018 - 0.0018	NA	NA	2.60E-02	c		No (a)
ALPHA-BHC	0 - 2	NA	0.0018 - 0.0018	NA	NA	7.10E-02	c		No (a)
ALPHA-CHLORDANE	0 - 2	NA	0.0018 - 0.0018	NA	NA	NA			No (a)
AROCLOR-1016	0 - 2	NA	0.035 - 0.035	NA	NA	4.90E+00	nc		No (a)
AROCLOR-1221	0 - 2	NA	0.071 - 0.071	NA	NA	6.60E-02	c		No (a)
AROCLOR-1232	0 - 2	NA	0.035 - 0.035	NA	NA	6.60E-02	c		No (a)
AROCLOR-1242	0 - 2	NA	0.035 - 0.035	NA	NA	6.60E-02	c		No (a)
AROCLOR-1248	0 - 2	NA	0.035 - 0.035	NA	NA	6.60E-02	c		No (a)
AROCLOR-1254	0 - 2	NA	0.035 - 0.035	NA	NA	1.40E+00	nc		No (a)
AROCLOR-1260	0 - 2	NA	0.035 - 0.035	NA	NA	6.60E-02	c		No (a)
BETA-BHC	0 - 2	NA	0.0018 - 0.0018	NA	NA	2.50E-01	c		No (a)
DELTA-BHC	0 - 2	NA	0.0018 - 0.0018	NA	NA	NA			No (a)
DIELDRIN	0 - 2	NA	0.0035 - 0.0035	NA	NA	2.80E-02	c		No (a)

Table 6-5

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Munitions Incinerator (Facility 1119, SS-34)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
ENDOSULFAN I	0 - 2	NA	0.0018 - 0.0018	NA	NA	NA			No (a)
ENDOSULFAN II	0 - 2	NA	0.0035 - 0.0035	NA	NA	NA			No (a)
ENDOSULFAN SULFATE	0 - 2	NA	0.0035 - 0.0035	NA	NA	NA			No (a)
ENDRIN	0 - 2	NA	0.0035 - 0.0035	NA	NA	2.00E+01	nc		No (a)
ENDRIN ALDEHYDE	0 - 2	NA	0.0035 - 0.0035	NA	NA	NA			No (a)
ENDRIN KETONE	0 - 2	NA	0.0035 - 0.0035	NA	NA	NA			No (a)
GAMMA-BHC (LINDANE)	0 - 2	NA	0.0018 - 0.0018	NA	NA	3.40E-01	c		No (a)
GAMMA-CHLORDANE	0 - 2	NA	0.0018 - 0.0018	NA	NA	NA			No (a)
HEPTACHLOR	0 - 2	NA	0.0018 - 0.0018	NA	NA	9.90E-02	c		No (a)
HEPTACHLOR EPOXIDE	0 - 2	NA	0.0018 - 0.0018	NA	NA	4.90E-02	c		No (a)
METHOXYCHLOR	0 - 2	NA	0.018 - 0.018	NA	NA	3.30E-02	nc		No (a)
TOXAPHENE	0 - 2	NA	0.18 - 0.18	NA	NA	4.00E-01	c		No (a)
Semivolatile Organics									
1,2,4-TRICHLOROBENZENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.20E+02	nc		No (a)
1,2-DICHLOROBENZENE	0 - 2	NA	0.35 - 0.35	NA	NA	2.30E+03	sat		No (a)
1,3-DICHLOROBENZENE	0 - 2	NA	0.35 - 0.35	NA	NA	2.80E+03	sat		No (a)
1,4-DICHLOROBENZENE	0 - 2	NA	0.35 - 0.35	NA	NA	7.40E+00	c		No (a)
2,2'-OXYBIS(1-CHLOROPROPANE)	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
2,4,5-TRICHLOROPHENOL	0 - 2	NA	0.87 - 0.88	NA	NA	6.50E+03	nc		No (a)
2,4,6-TRICHLOROPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	4.00E+01	c		No (a)
2,4-DICHLOROPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	2.00E+02	nc		No (a)
2,4-DIMETHYPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	1.30E+03	nc		No (a)
2,4-DINITROPHENOL	0 - 2	NA	0.87 - 0.88	NA	NA	1.30E+02	nc		No (a)
2,4-DINITROTOLUENE	0 - 2	NA	0.35 - 0.35	NA	NA	1.30E+02	nc		No (a)
2,6-DINITROTOLUENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.50E+01	c		No (a)
2-CHLORONAPHTHALENE	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
2-CHLOROPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	3.30E+02	nc		No (a)
2-METHYLNAPHTHALENE	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
2-METHYLPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	3.30E+03	nc		No (a)
2-NITROANILINE	0 - 2	NA	0.87 - 0.88	NA	NA	3.90E+00	nc		No (a)
2-NITROPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)

Table 6-5

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Munitions Incinerator (Facility 1119, SS-34)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
3,3'-DICHLOROBENZIDINE	0 - 2	NA	0.35 - 0.35	NA	NA	9.90E-01	c		No (a)
3-NITROANILINE	0 - 2	NA	0.87 - 0.88	NA	NA	NA			No (a)
4,6-DINITRO-2-METHYLPHENOL	0 - 2	NA	0.87 - 0.88	NA	NA	NA			No (a)
4-BROMOPHENYL-PHENYLETHER	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
4-CHLORO-3-METHYLPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
4-CHLOROANILINE	0 - 2	NA	0.35 - 0.35	NA	NA	2.60E+02	nc		No (a)
4-CHLOROPHENYL-PHENYLETHER	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
4-METHYLPHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	3.30E+02	nc		No (a)
4-NITROANILINE	0 - 2	NA	0.87 - 0.88	NA	NA	NA			No (a)
4-NITROPHENOL	0 - 2	NA	0.87 - 0.88	NA	NA	NA			No (a)
ACENAPHTHENE	0 - 2	NA	0.35 - 0.35	NA	NA	3.60E+02	sat		No (a)
ACENAPHTHYLENE	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
ANTHRACENE	0 - 2	NA	0.35 - 0.35	NA	NA	1.90E+01	sat		No (a)
BENZO(A)ANTHRACENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.10E-01	c		No (a)
BENZO(A)PYRENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.10E-02	c		No (a)
BENZO(B)FLUORANTHENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.10E-01	c		No (a)
BENZO(G,H,I)PERYLENE	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
BENZO(K)FLUORANTHENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.10E+00	c		No (a)
BIS(2-CHLOROETHOXY)METHANE	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
BIS(2-CHLOROETHYL)ETHER	0 - 2	NA	0.35 - 0.35	NA	NA	7.40E-02	c		No (a)
BIS(2-ETHYLHEXYL)PHTHALATE	0 - 2	NA	0.35 - 0.35	NA	NA	3.20E+01	c		No (a)
BUTYL BENZYL PHTHALATE	0 - 2	NA	0.35 - 0.35	NA	NA	1.30E+04	nc		No (a)
CARBAZOLE	0 - 2	NA	0.35 - 0.35	NA	NA	2.20E+01	c		No (a)
CHRYSENE	0 - 2	NA	0.35 - 0.35	NA	NA	2.40E+01	sat		No (a)
DI-N-BUTYL PHTHALATE	0 - 2	NA	0.35 - 0.35	NA	NA	6.50E+03	nc		No (a)
DI-N-OCTYL PHTHALATE	0 - 2	NA	0.35 - 0.35	NA	NA	1.30E+03	nc		No (a)
DIBENZ(A,H)ANTHRACENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.10E-02	c		No (a)
DIBENZOFURAN	0 - 2	NA	0.35 - 0.35	NA	NA	2.60E+02	nc		No (a)
DIESEL RANGE ORGANICS	0 - 2	NA	0.0053 - 0.0053	NA	NA	NA			No (a)
DIETHYL PHTHALATE	0 - 2	NA	0.35 - 0.35	NA	NA	5.20E+04	nc		No (a)
DIMETHYL PHTHALATE	0 - 2	NA	0.35 - 0.35	NA	NA	1.00E+05	max		No (a)

Table 6-5

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Munitions Incinerator (Facility 1119, SS-34)
OU-5 Remedial Investigation
Williams Air Force Base
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentrations	Range of Detection Limits	Arithmetic Mean	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	Arithmetic Mean of Background	COPC?
FLUORANTHENE	0 - 2	NA	0.35 - 0.35	NA	NA	2.60E+03	nc		No (a)
FLUORENE	0 - 2	NA	0.35 - 0.35	NA	NA	3.00E+02	sat		No (a)
HEXACHLOROBENZENE	0 - 2	NA	0.35 - 0.35	NA	NA	2.80E-01	c		No (a)
HEXACHLOROBUTADIENE	0 - 2	NA	0.35 - 0.35	NA	NA	5.70E+00	c		No (a)
HEXACHLOROETHANE	0 - 2	NA	0.35 - 0.35	NA	NA	3.20E+01	nc		No (a)
INDENO(1,2,3-CD)PYRENE	0 - 2	NA	0.35 - 0.35	NA	NA	6.10E-01	c		No (a)
ISOPHORONE	0 - 2	NA	0.35 - 0.35	NA	NA	4.70E+02	c		No (a)
N-NITROSO-DI-N-PROPYLAMINE	0 - 2	NA	0.35 - 0.35	NA	NA	6.30E-02	c		No (a)
N-NITROSODIPHENYLAMINE (1)	0 - 2	NA	0.35 - 0.35	NA	NA	9.10E+01	c		No (a)
NAPHTHALENE	0 - 2	NA	0.35 - 0.35	NA	NA	8.00E+02	sat		No (a)
NITROBENZENE	0 - 2	NA	0.35 - 0.35	NA	NA	3.30E+01	nc		No (a)
PENTACHLOROPHENOL	0 - 2	NA	0.87 - 0.88	NA	NA	2.50E+00	c		No (a)
PHENANTHRENE	0 - 2	NA	0.35 - 0.35	NA	NA	NA			No (a)
PHENOL	0 - 2	NA	0.35 - 0.35	NA	NA	3.90E+04	nc		No (a)
PYRENE	0 - 2	NA	0.35 - 0.35	NA	NA	2.00E+03	nc		No (a)

[a] PRG for thallium sulfate is used for thallium.

NA = Not applicable or not available
PRG = Preliminary remediation goals, EPA Region IX, 1995.
c = Cancer risk.
nc = Noncancer effect.
sat = Concentration at which chemicals soil absorptive and solubility limits have been reached.
max = Concentration >= 1E+05 mg/kg.
COPC = Chemical of potential concern.
No (a) = Not detected in any sample.
No (b) = Source-term concentration <= PRG.
No (c) = Mean concentration <= mean of background.

Table 6-6

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Concrete Hardfill Drum Removal Area (Portion of Site LF-26)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentration	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
Pesticides and PCBs							
4,4'-DDD	0 / 3	NA	0.0035 - 0.0035	NA	1.90E+00	c	No (a)
4,4'-DDE	3 / 3	0.0011 - 0.0011	0.0035 - 0.0035	0.0011	1.30E+00	c	No (b)
4,4'-DDT	0 / 3	NA	0.0035 - 0.0035	NA	1.30E+00	c	No (a)
ALDRIN	0 / 3	NA	0.0018 - 0.0018	NA	2.60E-02	c	No (a)
ALPHA-BHC	0 / 3	NA	0.0018 - 0.0018	NA	7.10E-02	c	No (a)
ALPHA-CHLORDANE	0 / 3	NA	0.0018 - 0.0018	NA	NA		No (a)
AROCLOR-1016	0 / 3	NA	0.035 - 0.035	NA	4.90E+00	nc	No (a)
AROCLOR-1221	0 / 3	NA	0.072 - 0.072	NA	6.60E-02	c	No (a)
AROCLOR-1232	0 / 3	NA	0.035 - 0.035	NA	6.60E-02	c	No (a)
AROCLOR-1242	0 / 3	NA	0.035 - 0.035	NA	6.60E-02	c	No (a)
AROCLOR-1248	0 / 3	NA	0.035 - 0.035	NA	6.60E-02	c	No (a)
AROCLOR-1254	0 / 3	NA	0.035 - 0.035	NA	1.40E+00	nc	No (a)
AROCLOR-1260	0 / 3	NA	0.035 - 0.035	NA	6.60E-02	c	No (a)
BETA-BHC	0 / 3	NA	0.0018 - 0.0018	NA	2.50E-01	c	No (a)
DELTA-BHC	0 / 3	NA	0.0018 - 0.0018	NA	NA		No (a)
DIELDRIN	3 / 3	0.012 - 0.013	0.0035 - 0.0035	0.013	2.80E-02	c	No (b)
ENDOSULFAN I	0 / 3	NA	0.0018 - 0.0018	NA	NA		No (a)
ENDOSULFAN II	0 / 3	NA	0.0035 - 0.0035	NA	NA		No (a)
ENDOSULFAN SULFATE	0 / 3	NA	0.0035 - 0.0035	NA	NA		No (a)
ENDRIN	0 / 3	NA	0.0035 - 0.0035	NA	2.00E+01	nc	No (a)
ENDRIN ALDEHYDE	0 / 3	NA	0.0035 - 0.0035	NA	NA		No (a)
ENDRIN KETONE	0 / 3	NA	0.0035 - 0.0035	NA	NA		No (a)
GAMMA-BHC (LINDANE)	0 / 3	NA	0.0018 - 0.0018	NA	3.40E-01	c	No (a)
GAMMA-CHLORDANE	0 / 3	NA	0.0018 - 0.0018	NA	NA		No (a)
HEPTACHLOR	0 / 3	NA	0.0018 - 0.0018	NA	9.90E-02	c	No (a)
HEPTACHLOR EPOXIDE	0 / 3	NA	0.0018 - 0.0018	NA	4.90E-02	c	No (a)
METHOXYCHLOR	0 / 3	NA	0.018 - 0.018	NA	3.26E+02	nc	No (a)
TOXAPHENE	0 / 3	NA	0.18 - 0.18	NA	4.00E-01	c	No (a)

Table 6-6

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Concrete Hardfill Drum Removal Area (Portion of Site LF-26)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentration	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
Semivolatile Organics							
1,2,4-TRICHLOROBENZENE	0 / 1	NA	0.0035 - 0.0035	NA	6.20E+02	nc	No (a)
1,2-DICHLOROBENZENE	0 / 1	NA	0.0035 - 0.0035	NA	2.30E+03	sat	No (a)
1,3-DICHLOROBENZENE	0 / 1	NA	0.0035 - 0.0035	NA	2.80E+03	sat	No (a)
1,4-DICHLOROBENZENE	0 / 1	NA	0.0035 - 0.0035	NA	7.40E+00	c	No (a)
2,2'-OXYBIS(1-CHLOROPROPANE)	0 / 1	NA	0.0035 - 0.0035	NA	6.35E+00	c	No (a)
2,4,5-TRICHLOROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	6.50E+03	nc	No (a)
2,4,6-TRICHLOROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	4.00E+01	c	No (a)
2,4-DICHLOROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	2.00E+02	nc	No (a)
2,4-DIMETHYPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	1.30E+03	nc	No (a)
2,4-DINITROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	1.30E+02	nc	No (a)
2,4-DINITROTOLUENE	0 / 1	NA	0.0035 - 0.0035	NA	1.30E+02	nc	No (a)
2,6-DINITROTOLUENE	0 / 1	NA	0.0035 - 0.0035	NA	6.50E+01	c	No (a)
2-CHLORONAPHTHALENE	0 / 1	NA	0.0035 - 0.0035	NA	5.21E+03	nc	No (a)
2-CHLOROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	3.30E+02	nc	No (a)
2-METHYLNAPHTHALENE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
2-METHYLPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	3.30E+03	nc	No (a)
2-NITROANILINE	0 / 1	NA	0.0035 - 0.0035	NA	3.90E+00	nc	No (a)
2-NITROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
3,3'-DICHLOROBENZIDINE	0 / 1	NA	0.0035 - 0.0035	NA	9.90E-01	c	No (a)
3-NITROANILINE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
4,6-DINITRO-2-METHYLPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
4-BROMOPHENYL-PHENYLETHER	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
4-CHLORO-3-METHYLPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
4-CHLOROANILINE	0 / 1	NA	0.0035 - 0.0035	NA	2.60E+02	nc	No (a)
4-CHLOROPHENYL-PHENYLETHER	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
4-METHYLPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	3.30E+02	nc	No (a)
4-NITROANILINE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
4-NI[illegible]PHENOL	0 / 1	NA	0.0035 - 0.0035	NA	NA		N[illegible]

Table 6-6

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Concrete Hardfill Drum Removal Area (Portion of Site LF-26)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentration	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
ACENAPHTHENE	0 / 1	NA	0.0035 - 0.0035	NA	3.60E+02	sat	No (a)
ACENAPHTHYLENE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
ANTHRACENE	0 / 1	NA	0.0035 - 0.0035	NA	1.90E+01	sat	No (a)
BENZO(A)ANTHRACENE	0 / 1	NA	0.0035 - 0.0035	NA	6.10E-01	c	No (a)
BENZO(A)PYRENE	0 / 1	NA	0.0035 - 0.0035	NA	6.10E-02	c	No (a)
BENZO(B)FLUORANTHENE	0 / 1	NA	0.0035 - 0.0035	NA	6.10E-01	c	No (a)
BENZO(G,H,I)PERYLENE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
BENZO(K)FLUORANTHENE	0 / 1	NA	0.0035 - 0.0035	NA	6.10E+00	c	No (a)
BIS(2-CHLOROETHOXY)METHANE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
BIS(2-CHLOROETHYL)ETHER	0 / 1	NA	0.0035 - 0.0035	NA	7.40E-02	c	No (a)
BIS(2-ETHYLHEXYL)PHTHALATE	0 / 1	NA	0.0035 - 0.0035	NA	3.20E+01	c	No (a)
BUTYLBENZYLPHTHALATE	0 / 1	NA	0.0035 - 0.0035	NA	1.30E+04	nc	No (a)
CARBAZOLE	0 / 1	NA	0.0035 - 0.0035	NA	2.20E+01	c	No (a)
CHRYSENE	0 / 1	NA	0.0035 - 0.0035	NA	2.40E+01	sat	No (a)
DI-N-BUTYLPHTHALATE	0 / 1	NA	0.0035 - 0.0035	NA	6.50E+03	nc	No (a)
DI-N-OCTYLPHTHALATE	0 / 1	NA	0.0035 - 0.0035	NA	1.30E+03	nc	No (a)
DIBENZ(A,H)ANTHRACENE	0 / 1	NA	0.0035 - 0.0035	NA	6.10E-02	c	No (a)
DIBENZOFURAN	0 / 1	NA	0.0035 - 0.0035	NA	2.60E+02	nc	No (a)
DIETHYLPHTHALATE	0 / 1	NA	0.0035 - 0.0035	NA	5.20E+04	nc	No (a)
DIMETHYLPHTHALATE	0 / 1	NA	0.0035 - 0.0035	NA	1.00E+05	max	No (a)
FLUORANTHENE	0 / 1	NA	0.0035 - 0.0035	NA	2.60E+03	nc	No (a)
FLUORENE	0 / 1	NA	0.0035 - 0.0035	NA	3.00E+02	sat	No (a)
HEXACHLOROBENZENE	0 / 1	NA	0.0035 - 0.0035	NA	2.80E-01	c	No (a)
HEXACHLOROBUTADIENE	0 / 1	NA	0.0035 - 0.0035	NA	5.70E+00	c	No (a)
HEXACHLOROETHANE	0 / 1	NA	0.0035 - 0.0035	NA	3.20E+01	nc	No (a)
INDENO(1,2,3-CD)PYRENE	0 / 1	NA	0.0035 - 0.0035	NA	6.10E-01	c	No (a)
ISOPHORONE	0 / 1	NA	0.0035 - 0.0035	NA	4.70E+02	c	No (a)
N-NITROSO-DI-N-PROPYLAMINE	0 / 1	NA	0.0035 - 0.0035	NA	6.30E-02	c	No (a)
N-NITROSODIPHENYLAMINE	0 / 1	NA	0.0035 - 0.0035	NA	9.10E+01	c	No (a)

Table 6-6

Statistical Summary and COPC Selection for 1995 Subsurface Soil Sample Analysis
Concrete Hardfill Drum Removal Area (Portion of Site LF-26)
OU-5 Remedial Investigation
Williams AFB, Arizona
(mg/kg)

Chemical (mg/kg)	Frequency of Detection	Range of Detected Concentration	Range of Detection Limits	Source-Term Concentration	Residential PRGs	Cancer/ Noncancer	COPC?
NAPHTHALENE	0 / 1	NA	0.0035 - 0.0035	NA	8.00E+02	sat	No (a)
NITROBENZENE	0 / 1	NA	0.0035 - 0.0035	NA	3.30E+01	nc	No (a)
PENTACHLOROPHENOL	0 / 1	NA	0.0035 - 0.0035	NA	2.50E+00	c	No (a)
PHENANTHRENE	0 / 1	NA	0.0035 - 0.0035	NA	NA		No (a)
PHENOL	0 / 1	NA	0.0035 - 0.0035	NA	3.90E+04	nc	No (a)
PYRENE	0 / 1	NA	0.0035 - 0.0035	NA	2.00E+03	nc	No (a)

NA = Not Applicable or Not Available
PRG = Preliminary Remediation Goals, EPA Region IX, 1995a.
c = cancer risk
nc = noncancer effect
sat = concentration at which chemicals soil absorptive and solubility limits have been reached
max = concentration >= 1E+05 mg/kg
COPC = Chemical of potential concern
No (a) = Not detected in any sample.
No (b) = Source-term concentration <= PRG.

- Frequency of detection
- Range of detection limits
- Source-term concentration
- Mean concentrations
- Background mean concentrations
- Region IX PRGs
- COPCs selection.

Because of the uncertainty associated with characterizing contamination in environmental media, EPA (1989) recommends that the 95 percent upper confidence limit (UCL) on the mean or the maximum detected concentration, whichever is smaller, should be adopted as the source-term concentration. During the confirmatory sampling round, a maximum of three samples were taken for the compounds analyzed at all the sites (Tables 6-1 through 6-6). Ninety-five percent UCLs could not, therefore, be estimated, because a minimum of four samples is required to estimate UCLs. Thus, the maximum concentrations were adopted as the source-term concentrations at all the sites.

Analytical results are presented as nondetects whenever constituent concentrations in samples do not exceed the detection or quantitation limits for the analytical procedures for those samples. Generally, the detection limit is the lowest concentration of a constituent that can be "seen" above the normal, random noise of an analytical instrument or method. To apply these statistical procedures to a data set with nondetects, a concentration value must be assigned to nondetects. In this assessment, one-half the detection limit was assigned to the nondetects (EPA, 1989).

The Region IX PRG tables provide multiple listings for various forms of nickel; the entry for soluble salts was selected as most closely approximating the form of nickel expected to be present in soils at OU.5.

6.2.5 Contaminants of Potential Concern for Subsurface Soil

6.2.5.1 Airfield USTs (ST-25)

Constituents analyzed in subsurface soil samples from ST-25 are listed in Table 6-1. Methylene chloride was the only chemical detected, but its source-term concentration was less than the PRG; thus, no COPCs were selected at this site.

6.2.5.2 Paint Shop Leach Field (WP-27)

Constituents analyzed for in subsurface soil samples from WP-27 are listed in Table 6-2. The metals cadmium, chromium, copper, lead, nickel, selenium, thallium, and zinc were eliminated from the list of COPCs because their source-term concentrations were less than their respective PRGs. The mean site concentration for beryllium was less than its background mean concentration; therefore, it was eliminated as a COPC. Organics for which analyses were performed were not detected in any of the samples. Arsenic, with a source-term concentration of 9.6 mg/kg, was the only COPC selected at WP-27.

6.2.5.3 Prime Beef Yard (SS-29)

Constituents analyzed for in subsurface soil samples from SS-29 are listed in Table 6-3. The metals chromium, copper, lead, nickel, selenium, thallium, and zinc were eliminated from the list of COPCs because their source-term concentrations were less than their respective PRGs. The mean site concentration for beryllium was less than its background mean concentration; therefore, it was eliminated as a COPC. Methylene chloride was the only organic compound detected, but it was excluded from the COPC list because its source-term concentration was less than the PRG. Arsenic, with a source-term concentration of 6.3 mg/kg, was the only COPC selected at SS-29.

6.2.5.4 Golf Course Maintenance Area (SS-31)

Constituents analyzed for in subsurface soil samples from SS-31 are listed in Table 6-4. Because the constituents were not detected, no COPCs were selected at this site.

6.2.5.5 Munitions Incinerator (Facility 1119, SS-34)

Constituents detected in subsurface soil samples from the Munitions Incinerator are listed in Table 6-5. The metals chromium, copper, lead, nickel, selenium, thallium, and zinc were eliminated from the list of COPCs because their source-term concentrations were less than their respective PRGs. The mean site concentration for beryllium was less than its background mean concentration; therefore, it was eliminated as a COPC. Organics for which analyses were performed were not detected in any of the samples. Arsenic, with a source-term concentration of 5.8 mg/kg, was the only COPC selected at the munitions incinerator.

6.2.5.6 Concrete Hardfill Drum Removal Area (LF-26)

Constituents analyzed in subsurface soil samples from LF-26 are listed in Table 6-6. 4,4,-DDE and dieldrin were the only compounds that were detected, but they were excluded

from the COPC list because their source-term concentrations were less than the PRGs. Thus, no COPCs were selected at this site.

6.2.5.7 Sewage Sludge Stockpile (Area 28)

At the Sewage Sludge Stockpile Area (Area 28), the pesticide dieldrin was detected at concentrations exceeding both the Arizona HBGL and the PRGs in soil. Risk assessment criteria for surface exposures were applied to the dieldrin concentrations, and the assessment determined that the risk is considered acceptable. The risk criteria did not account for exposures via drinking water. This exposure route would occur if the dieldrin were to migrate through the unsaturated zone to groundwater, which would then be withdrawn from the aquifer and consumed.

A preliminary computer analysis was conducted to determine the migration potential of dieldrin through the soils at Area 28. The analysis comprised modeling the migration of dieldrin through the unsaturated soils and determining the resulting groundwater concentrations as a result of any movement. If the modeling effort showed that future concentrations of dieldrin in groundwater were projected to be above action limits, then additional analysis and a more formal risk assessment could be performed.

The two-dimensional computer model Multiphase Flow and Transport (MOTRANS) (Environmental System and Technology, Inc. [ES&T], 1992) was used in this analysis. MOTRANS is capable of simulating flow and transport in two-phase (air-water) or three-phase (air, water, nonaqueous phase liquid) porous media systems. This model was also used in association with the Operable Unit 3 fate and transport projections at the Liquid Fuels Storage Area (ST-12) to model the movement of JP-4 and selected chemical components through the soils to groundwater. With minor modifications, the model setup and parameters from the ST-12 effort were used in modeling Area 28.

The major modifications to the model for Area 28 included input of the chemical and physical properties of dieldrin, and adjustments to the subsurface soil physical properties. The soil profile was kept consistent between the ST-12 and Area 28 model; however, the vertical hydraulic conductivities of certain layers in the profile were increased in the Area 28 model. Certainly there are differences between the stratigraphy at ST-12 and Area 28, yet it can be asserted that the overall profile would contain many similarities. Because little is known of the geology at Area 28, the geologic information at ST-12 was transferred for use at Area 28.

The profile at ST-12 contains several fine-grained layers that tend to impede the downward movement of contaminants. The vertical hydraulic conductivities of these layers were increased by a factor of 10 in the Area 28 model. This was done because the presence of these layers is unknown and to allow for increased movement potential of the dieldrin through the unsaturated zone.

Also to be conservative in the modeling approach, the depth to groundwater (or the thickness of the unsaturated zone) was kept consistent with the ST-12 model. At ST-12, the average depth to groundwater is approximately 215 feet below ground surface. At Area 28, this depth is unknown, but a nearby well at Fire Protection Training Area Number 1 shows an average depth to groundwater of approximately 250 feet below ground surface. Using a thinner unsaturated soil column for the dieldrin to move through is consistent with the conservative approach.

This modeling effort only simulated the downward migration (one-dimensional model) of dieldrin through the unsaturated zone. The grid spacing used in the model was 6.6 feet or less. Because of the small annual rainfall and higher evapotranspiration rate, the seepage rate of precipitation entering the unsaturated zone was assumed to be 1/2 inch per year. this water percolation was introduced to the system by applying a constant flow boundary at the ground surface. A constant water head condition was set at the bottom of the grid system to maintain the groundwater table at 215 feet below ground surface. Before dieldrin was introduced to the system, the steady-state water saturation profile in the soil was obtained by running the established flow model.

A retardation factor for dieldrin of 3.7 was estimated using the limit of K_{oc} (3960 cm^3/g) found in the literature (Montgomery and Welkom, 1990) and from the organic carbon content of soil samples at ST-12. The longitudinal dispersivity of transport was assumed to be 3.3 feet in the model. The highest concentration of dieldrin reported in the field sampling program was 0.23 mg/kg, which was used as the loading source in the model. Dieldrin found in the soil was assumed to be partitioned between the water phase (dissolved) and the solid phase (absorbed) under equilibrium conditions. The calculation showed that the concentration of the dissolved phase may reach the solubility limit of dieldrin (140 µg/L). In the transport model, the dieldrin loading source was represented by a constant concentration boundary at the ground surface with c = 140 µg/L. The loading source was kept constant throughout the simulation to be conservative. The transport of dieldrin at Area 28 was simulated for a 100-year period.

The simulated distributions of dissolved dieldrin concentration with depth at 25, 50, and 100 years are plotted in Figure 6-1. At the end of the 100-year simulation, the dieldrin concentration is equal to 140 µg/L at the ground surface and rapidly decreases with depth. The dieldrin concentration is projected to be less than 0.1 µg/L at a depth of 500 feet after 100 years. The total dieldrin introduced to the unsaturated system in the 100 years over a one square meter area is 0.48 g (0.08 g in the dissolved phase and 0.4 g in the absorbed phase). If assuming the depth of contaminated soil is 1 meter and the density of soil is 2 g/cm^3, the total dieldrin available in the source is 0.46 g.

In conclusion, the transport of dieldrin through the unsaturated soil at Area 28 was simulated for a 100-year period. It was assumed that all of the dieldrin detected in soil samples was available for leaching for the entire simulated period. The modeling results show that there is no potential impact to the groundwater system.

Additionally, the range of dieldrin was from 0.0037 to 0.23 mg/kg with the maximum detected concentration about four times the residential PRG and similar to the level detected at LF-04 of 0.25 mg/kg. Because of the similarities in constituents between Area 28 and LF-04, there can be a comparison with the risk assessment results at LF-04 shown in the OU-1 Remedial Investigation Report Addendum which shows a maximum risk from dieldrin in soil of 5.8×10^{-6} (assuming the same potential receptors and exposure pathways are evaluated). This is within the target risk range of 10^{-6} to 10^{-4} as established by the NCP, and is considered acceptable. A screening fate and transport risk assessment was completed and the results indicated that there is no unacceptable risk to human health. No other action appears to be warranted at this area.

6.3 Exposure Assessment

This section presents the default exposure assessment used to estimate PRGs (EPA, 1995). The default exposure assessment provides a conservative screening level estimate of potential exposures of human receptors to constituents found at the site. Exposure is defined as the contact of a receptor with a chemical. Exposure assessment is the estimation of the magnitude, frequency, and duration of contact for each identified route of exposure. The magnitude of an exposure is determined by estimating the amount of chemical available at the receptor exchange boundaries (i.e., lungs, gastrointestinal tract, or skin) during a specified time period. The general procedure for conducting an exposure assessment is (EPA, 1989):

- Characterization of exposure setting
- Identification of potential exposure pathways

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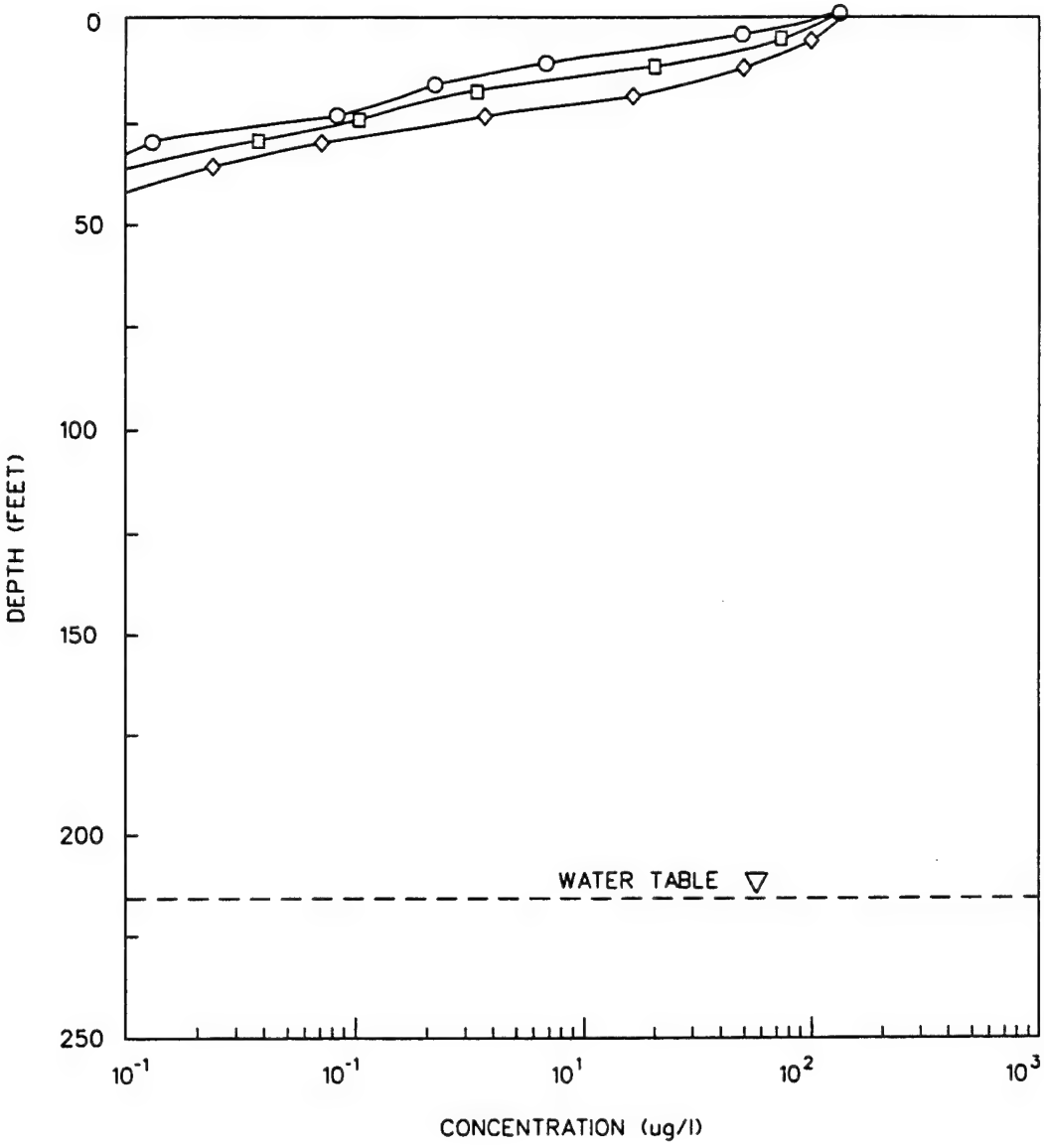
DRAWN BY: K. WOOD	DRAWN BY:	ENGR. CHCK. BY:	PROJ. MGR.: W. CARTER	PROJ. NO.: 409881



LEGEND:

—○— 25-YEAR

—□— 50-YEAR

—◇— 100-YEAR

FIGURE 6-1
SIMULATED DIELDRIN CONCENTRATION vs. DEPTH AT 25, 50, AND 100 YEARS SEWAGE SLUDGE STOCKPILE AREA

WILLIAMS AIR FORCE BASE
ARIZONA

INTERNATIONAL TECHNOLOGY CORPORATION

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- Quantification of exposure (where possible).

6.3.1 Characterization of Exposure Setting

Chapter 3.0 describes the physical characteristics of the Base as well as the population, both human and environmental, living on or near the area that may be affected by the contaminants at the site.

Receptor Assessment. The conservative residential receptor outlined in EPA (1995) was used for all the sites evaluated in this SLRA.

6.3.2 Identification of Potential Exposure Pathways

The default exposure pathways for the residential land-use scenario used to calculate PRGs (EPA, 1995) are adopted for all the sites evaluated in this SLRA. Exposure is limited to soil only and the exposure pathways include ingestion, inhalation of particulates, and inhalation of volatiles. As noted in Section 2.2.3, groundwater at this site is not expected to be impacted; therefore, exposure to groundwater was not included.

6.3.3 Estimation of Exposure

This section describes the concentration estimation of individual site-related constituents of concern that may reach human receptors. As described earlier, the exposure models and input parameters are the default values used to calculate the PRGs (EPA, 1995) for the residential soil exposure scenario. The source concentration is adopted as a screening level exposure-point concentration. Hence, it is conservatively assumed that the residents are directly exposed to the contaminated subsurface soils at all the sites.

6.4 Risk Characterization

Once COPCs were identified, an evaluation was performed for each site to estimate the cancer risk or noncancer hazard quotient (HQ) associated with each chemical in soil. Cancer risks and noncancer HQs were calculated for the residential scenarios for the COPCs retained.

PRGs based on carcinogenicity are concentrations that correspond to a risk of 10^{-6}. Therefore, the cancer risk associated with the source concentration was estimated as follows:

$$ILCR = \left(\frac{SC}{PRG_c}\right) 10^{-6} \qquad \text{Eq. 6.1}$$

where:

ILCR	=	incremental lifetime cancer risk (unitless probability)
SC	=	source concentration (mg/kg)
PRG_c	=	cancer-based PRG (mg/kg)
10^{-6}	=	cancer risk corresponding to the PRG.

PRGs based on noncancer effects are concentrations that correspond to a HQ of 1. Therefore, the HQ associated with the source concentration was estimated as follows:

$$HQ = \left(\frac{SC}{PRG_n}\right) 1.0 \qquad \text{Eq. 6.2}$$

where:

HQ	=	hazard quotient for noncancer effects (unitless ratio)
SC	=	source concentration (mg/kg)
PRG_n	=	noncancer-based PRG (mg/kg)
1.0	=	HQ corresponding to the PRG.

The individual ILCRs are summed to estimate a total cancer risk associated with exposure to the soil at the site of interest. Similarly, the individual HQs are summed to estimate a total noncancer HI for the site. The results of these analyses for all the sites evaluated in OU-5 are presented in Table 6-7.

Chemicals selected as COPCs would be evaluated for both cancer and noncancer effects if they are known to induce both the effects. Arsenic, which was the only compound selected as a COPC (Tables 6-1 to 6-6), is known to induce both cancer and noncancer effects. It was selected as a COPC because its source-term concentrations exceeded its cancer PRG of 0.32 mg/kg, and not its noncancer PRG of 22 mg/kg (EPA, 1995). It may be noted that a risk range of 10^{-6} to 10^{-4} and an HI less than 1 are generally considered acceptable under the EPA guidelines used to evaluate risk (1989a, 1990).

Table 6-7

Summary of Risk Evaluation for Sites in OU5
Williams Air Force Base

Chemical (mg/kg)	Source-Term Concentration	Cancer Residential PRGs	Noncancer Residential PRGs	Target Cancer Risk	Target Hazard Index
Site: Airfield USTs (ST-25)					
No COPC's present					
Site: Paint Shop Leach Field (WP-27)					
Arsenic	9.6	3.20E-01	22	3.00E-05	4.36E-01
Site: Prime Beef Yard (SS-29)					
Arsenic	6.3	3.20E-01	22	1.97E-05	2.86E-01
Site: Golf Course Maintenance Area (SS-31)					
No COPC's present					
Site: Munitions Incinerator					
Arsenic	5.8	3.20E-01	22	1.81E-05	2.64E-01
Site: Concrete Hardfill Drum Removal Area (Portion of LF-26)					
No COPC's present					

COPC = Chemical of potential concern.

PRG = Preliminary remediation goals, EPA Region IX, 1995.

The site-specific risk results are discussed in the following paragraphs.

Airfield USTs (ST-25). No COPCs were identified for this site; therefore, it can be concluded that this site poses no unacceptable risk to human health or the environment.

Paint Shop Leach Field (WP-27). Arsenic was the only COPC selected at this site. From Table 6-7, it can be seen that the screening level risk (3×10^{-5}) and HI (0.4) for arsenic are within acceptable limits (EPA, 1989a, 1990). Because the conservative estimate of risk and HI are within an acceptable range, it is concluded that this site poses no unacceptable risk to human health or the environment.

Prime Beef Yard (SS-29). Arsenic was the only COPC selected at this site. From Table 6-7, it can be seen that the screening level risk (2×10^{-5}) and HI (0.3) for arsenic are within acceptable limits (EPA, 1989a, 1990). Given that the conservative estimate of risk and HI are within an acceptable range, it is concluded that this site poses no unacceptable risk to human health or the environment.

Golf Course Maintenance Area (SS-31). No COPCs were identified for this site; therefore, it can be concluded that this site poses no unacceptable risk to human health or the environment.

Munitions Incinerator (Facility 1119, SS-34). Arsenic was the only COPC selected at this site. From Table 6-7, it can be seen that the screening level risk (1.8×10^{-5}) and HI (0.3) for arsenic are within acceptable limits (EPA, 1989a, 1990). Given that the conservative estimate of risk and HI are within an acceptable range, it is concluded that this site poses no unacceptable risk to human health or the environment.

Concrete Hardfill Drum Removal Area (LF-26). No COPCs were identified for this site; therefore, it can be concluded that this site poses no unacceptable risk to human health or the environment.

6.5 Uncertainty Evaluation

6.5.1 Terminology

Generally, risk assessments carry two types of uncertainty. Measurement uncertainty refers to the usual variance that accompanies scientific measurements, e.g., instrument uncertainty

(accuracy and precision) associated with constituent concentrations. The results of the risk assessment reflect the accumulated variances of the individually measured values used to develop it. A different kind of uncertainty, called informational uncertainty, stems from data gaps, i.e., the fact that additional information is needed to complete the database for the assessment. Often the data gap is significant, such as the absence of information on the effects of human exposure to a constituent or on the biological mechanism of action of an agent (EPA, 1992).

Reliance on a simplified numerical presentation of risk without consideration of uncertainties, limitations, and assumptions inherent in the assessment process can be misleading. For example, a lifetime cancer risk of 10^{-6} may be calculated for a given exposure scenario. However, if the uncertainty in this estimate is several orders of magnitude, the real risk may be higher than the risk from another scenario that has a calculated lifetime risk of cancer of 10^{-5} but a smaller degree of uncertainty.

Alternatively, a lifetime cancer risk of 10^{-2} may be calculated and appear to represent an unacceptable risk. The actual risk, however, may be one, two, or even three orders of magnitude smaller. Situations like this occur frequently, because the estimated risk reflects conservative assumptions on lifestyles and land-use scenarios, maximum or near-maximum values for almost all modeling and exposure variables, limited information and uncertainty in the calculational parameters, and conservative assumptions in the toxicity value derivations. Conservative assumptions are concatenated to ensure that the risks are not underestimated.

EPA guidance on risk assessment urges risk assessors to address or provide descriptions of individual risk to include the "high end" portions and "central tendency" of the risk distribution (EPA, 1992). This guidance corresponds to the reasonable conservatism and nonconservatism, respectively, of the scenarios for this assessment. If only limited information on the distribution of the exposure or dose factors is available, the assessor should approach estimating the high end risk by identifying the most sensitive parameters and using maximum or near-maximum values for one or a few of these variables, leaving others at their mean values (EPA, 1992).

6.5.2 Sources of Uncertainty

As noted previously, uncertainties are associated with the information and data used in each phase of the baseline risk assessment. Uncertainties associated with information and data are evaluated in this section to provide a sound, balanced basis for evaluating the overall quality

of the risk assessment results. Sources of uncertainty, as well as the direction of bias that results (i.e., whether conservatism is increased or decreased) are presented in the following sections.

6.5.2.1 Selection and Quantification of COPCs

Uncertainty associated with the selection process used to determine the COPC and estimation of source-term concentrations arises from:

- Surface soils were not collected from any of the sites evaluated; however, it is believed that the nature of the contamination would be best reflected by sampling subsurface soil because these sites were backfilled and covered with clean soil.

- Estimated summary statistics are uncertain and overconservative. For statistical purposes, if a constituent is positively identified at a site and has at least a single positive hit, all the samples with nondetects are assumed to have a value equal to half the minimum detectable activity and are included in the data set. These procedures introduce a conservative bias into the risk assessment.

- Limited number of samples result in the calculation of wide confidence intervals on the mean concentration and high source-term concentrations. Ninety-five percent UCLs on the mean could not be estimated at several sites due to too few samples. Thus, the maximum concentrations were adopted as the source-term introducing a conservative bias into the risk assessment.

- Laboratory analytical techniques have a degree of uncertainty associated with them. These uncertainties are documented by using data qualifiers to reflect the degree of certainty of measurement. The direction of bias is unclear.

- The COPC selection was based on PRGs that may not reflect plausible site-specific land use scenarios.

6.5.2.2 Exposure Point Concentrations

It was assumed that the source-term concentration were also the exposure-point concentrations for the purposes of the SLRA. However, it is unlikely that a residential receptor would be exposed to subsurface soil. Hence, this assumption introduces a highly conservative bias into the risk assessment.

6.5.2.3 Selection of Hypothetical Receptors and Potential Exposure Pathways

As previously noted, the selection of a residential receptor being exposed to subsurface soil introduces a highly conservative bias into the risk assessment.

6.5.2.4 Risk Characterization

The primary goal of this assessment was to conduct a screening level assessment. Therefore, conservative biases exist at every phase of this assessment. These biases are additive, resulting in overly conservative risk, or HQ, estimates.

This effort to identify potential uncertainties associated with each step of the risk assessment is not intended to discredit the calculated results, but to point out that risks are calculated for hypothetical receptors under a definite, strict method. Refinements of sampling plans, analytical techniques, data statistical evaluation, exposure assessment models and parameters, hazard evaluation, dose-response assessment, and risk characterization could reduce these uncertainties.

6.6 Conclusions

There were no COPCs selected at LF-26, SS-31, and ST-25; the screening level target cancer risks at WP-27, SS-29, and the munitions incinerator are within the acceptable risk range (10^{-6} to 10^{-4}). In addition, no COPCs were selected based on noncancer PRGs. Thus, it can be concluded that the sites at OU-5 pose no unacceptable risk to human health or the environment.

7.0 Summary and Conclusions

7.1 Summary

The objective of this project was to complete a contaminant removal and verification of cleanliness at OU-5. This OU-5 RI report focuses on the removal actions required at each site, and on postremoval sampling and analysis to verify that no unacceptable levels of residual contamination remain for any future reuse of the Base.

OU-5 included the following eight sites:

- Airfield USTs (Site ST-25)
- Paint Shop Leach Field (Site WP-27)
- Sewage Sludge Trenches (Site DP-28)
- Prime Beef Yard (Site SS-29)
- Golf Course Maintenance Area (Site SS-31)
- Building 1070 (SS-32)
- Munitions Incinerator (Facility 1119, SS-34)
- Concrete Hardfill Drum Removal Area (LF-26).

The OU-5 investigations are governed under CERCLA rather than RCRA because they do not concern sites where hazardous wastes are being stored as part of continuing operations. Soil removal, sampling, and analyses occurred during the July 1995 field activities at all of these sites except the Sewage Sludge Trenches and Building 1070.

Sewage Sludge Trenches (DP-28). No action was required under the OU-5 removal actions because the Sewage Sludge Trenches were capped as part of the final remedy for the Landfill (LF-04) under OU-1. This action was taken because of the close proximity and common contamination (dieldrin) at both the landfill site and Sewage Sludge Trenches (IT, 1995e).

Building 1070 (SS-32). The OU-5 work plan required removing the gravel and underlying soil in an area near Building 1070. A soil staining was previously observed in the gravel parking area and was presumed to be oil drippings from a vehicle or other equipment. Collection of two samples was planned for this site.

However, during the site inspection, prior to excavation, no staining was observed. On July 19, 1995, during a TWG meeting, the TWG members inspected the site and could not detect

any staining nor evidence of the previously cited potentially contaminated area. There was agreement of all members that no action was necessary. Thus, no excavation/sampling was required or done.

7.1.1 Nature and Extent of Contamination

The remaining six OU-5 sites underwent soil or drum removal activities and soil sample collection and analyses.

Airfield USTs (ST-25). The only constituent detected was methylene chloride. The maximum estimated concentration was 3 µg/kg. Because methylene chloride is a laboratory reagent, this can be explained as a laboratory contaminant, and the concentration was below both the Arizona HBGL and Region IX PRG levels. This site, therefore, required no further action.

Paint Shop Leach Field (WP-27). Nine metals were detected in each of the three samples at this site. Of these metals, however, only arsenic and beryllium exceeded the Arizona HBGL and Region IX PRG levels. The maximum arsenic concentration was 9.6 mg/kg. The maximum beryllium concentration was at 0.49 mg/kg. Each analyte was also above the background level for these metals.

Prime Beef Yard (SS-29). Nine metals were detected in the four samples. Of these metals, however, only arsenic and beryllium exceeded the Base background range for these metals and also exceeded the HBGL and Region IX PRG levels. The maximum arsenic concentration was 6.3 mg/kg. The maximum concentration of beryllium was 0.78 mg/kg. Methylene chloride was detected at an estimated concentration of 4 µg/kg. The latter was well below either the Arizona HBGL and Region IX PRG levels.

Golf Course Maintenance Area (SS-31). Two samples were taken at this area, but no contaminants were detected. Thus, this site required no further action.

Munitions Incinerator (Facility 1119, SS-34). Nine metals were detected in one sample and eight metals were detected in the second sample. Only arsenic and beryllium exceeded the Base background range for metals and also exceeded the Arizona HBGL and Region IX PRG levels. The maximum arsenic concentration was 5.8 mg/kg. Beryllium was detected in only one sample, at 0.65 mg/kg.

Concrete Hardfill Drum Removal Area (LF-26). Low levels of the pesticides 4,4-DDE (1.1 µg/kg) and dieldrin (12 µg/kg) were detected in the one sample taken at this site. Both compounds were well below the Arizona HBGL and Region IX PRG levels. Therefore, this site requires no further action.

Sewage Sludge Stockpile Area (Area 28). There were 5 SVOCs, 6 pesticides/PCBs, and 11 metals detected at Area 28. None of the SVOC constituents exceeded both the Arizona HBGL and the EPA residential PRG levels. None of the metals exceeded the highest value for Base-specific background, regional background range, HBGL, and residential PRG. Only dieldrin of the pesticides/PCBs exceeded both the HBGL and residential PRG.

7.1.2 Ecological Risk Assessment

Since the Airfield USTs (Site ST-25), the Golf Course Maintenance Area (Site SS-31), and the Concrete Hardfill Drum Removal Area (Portion of Site LF-26) required no further action, no COPCs for subsurface soil were selected.

COPCs were selected for the following sites and underwent further risk analyses:

Paint Shop Leach Field (Site WP-27). The metals cadmium, chromium, copper, lead, nickel, selenium, thallium, and zinc were eliminated from the list of COPCs because their source-term concentrations were less than their respective PRGs. Beryllium was also eliminated as a COPC because its mean site concentration was less than its background mean concentration. Organics for which analyses were performed were not detected in any of the samples. Arsenic, with a source-term concentration of 9.6 mg/kg, was the only COPC selected at WP-27.

Prime Beef Yard (Site SS-29). The metals chromium, copper, lead, nickel, selenium, thallium, and zinc were eliminated from the list of COPCs because their source-term concentrations were less than their respective PRGs. Beryllium was eliminated as a COPC because its mean site concentration was less than its background mean concentration. Methylene chloride was the only organic compound detected, but it was excluded from the COPC list because its source-term concentration was less than the PRG. Arsenic, with a source-term concentration of 6.3 mg/kg, was the only COPC selected at SS-29.

Munitions Incinerator (Facility 1119, SS-34). The metals chromium, copper, lead, nickel, selenium, thallium, and zinc were eliminated from the list of COPCs because their source-term concentrations were less than their respective PRGs. Beryllium was eliminated as a COPC because its mean site concentration was less than its background mean concentration. Organics for which analyses were performed were not detected in any of the samples. Arsenic, with a source-term concentration of 5.8 mg/kg, was the only COPC selected at the Munitions Incinerator.

Sewage Sludge Stockpile Area (Area 28). Only dieldrin was above both the HBGL and residential PRG levels for a single duplicate sample (Location 28-01) out of the three samples collected. All other chemicals were at or below these levels or the Base-specific or regional range. The range of dieldrin was from 0.0037 to 0.23 mg/kg with the maximum detected concentration approximately four times the residential PRG and was similar to the level detected at LF-04 of 0.25 mg/kg.

7.1.3 Human Health Risk Assessment

Once COPCs were identified, an evaluation was performed for each site to estimate the cancer risk or noncancer HQ associated with each chemical in soil. Cancer risks and noncancer HQs were calculated for the residential scenarios for the COPCs retained.

Arsenic, which was the only compound selected as a COPC, is known to induce both cancer and noncancer effects. It was selected as a COPC because its source-term concentrations exceeded its cancer PRG of 0.32 mg/kg, and not its noncancer PRG of 22 mg/kg (EPA, 1995). Because arsenic would not have been selected as a COPC based on its noncancer PRG, its noncancer hazard was not evaluated.

Paint Shop Leach Field (Site WP-27). The screening level risk for arsenic was 3.0×10^{-5}, which is within the acceptable EPA range of 10^{-6} to 10^{-4}. Because the conservative estimate of risk is within an acceptable range, this site poses no unacceptable risk to human health or the environment.

Prime Beef Yard (Site SS-29). The screening level risk for arsenic was 2.0×10^{-5}, which was within the acceptable EPA range of 10^{-6} to 10^{-4}. Since the conservative estimate of risk is within an acceptable range, this site poses no unacceptable risk to human health or the environment.

Munitions Incinerator (Facility 1119, SS-34). The screening level risk for arsenic was 1.8×10^{-5}, which is within the acceptable EPA range of 10^{-6} to 10^{-4}. Since the conservative estimate of risk is within an acceptable range, this site poses no unacceptable risk to human health or the environment.

Sewage Sludge Stockpile Area (Area 28). Because of the similarities in chemicals between Area 28 and LF-04, a comparison was made with the risk assessment results at LF-04 shown in the OU-1 RI report addendum (IT, 1994a), which shows a maximum risk from dieldrin in soil of 5.8×10^{-6} (assuming the same potential receptors and exposure pathways are evaluated). This result is within the target risk range of 10^{-6} to 10^{-4}, and is considered acceptable by EPA. A screening fate and transport risk assessment was completed and the results indicate this site poses no unacceptable risk to human health or the environment. Even though no action was required, the stockpile area was removed in January 1996 and material properly disposed at an approved landfill. No further action is required at this area.

7.2 Conclusions/Recommendations

The fate and transport of the organic or inorganic analytes that exist at OU-5 sites will pose no threat to groundwater due to the concentrations present and extensive depth to groundwater. Any migration would result in a redistribution of contaminants, and since concentrations are small, they will continue to decrease, as some will remain fixed on the soil profile or within pore spaces.

Additionally, based on extensive risk analyses, no COPCs were selected at Sites LF-26, SS-31, and ST-25. The screening level target cancer risk at Sites WP-27, SS-29, SS-34, and Area 28 are within the acceptable EPA risk range (10^{-6} to 10^{-4}). Also, no COPCs were selected based on noncancer PRGs. It can be concluded that the sites at OU-5 pose no unacceptable risk to human health or the environment.

Thus, it is recommended that no further remedial action is required for these sites to protect human health and the environment.

8.0 References

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APPENDIX A

SUMMARY OF VALIDATED DATA

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
AIRFIELD USTs, ST-25															
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	1,2,4-TRICHLOROBENZENE	370	U	370	UG/KG	1,200,000	620,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	1,2-DICHLOROBENZENE	370	U	370	UG/KG	11,000,000	2,300,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	1,3-DICHLOROBENZENE	370	U	370	UG/KG	10,000,000	2,800,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	1,4-DICHLOROBENZENE	370	U	370	UG/KG	57,000	7,400		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,4,5-TRICHLOROPHENOL	930	U	930	UG/KG	12,000,000	6,500,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,4,6-TRICHLOROPHENOL	370	U	370	UG/KG	120,000	40,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DICHLOROPHENOL	370	U	370	UG/KG	350,000	200,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DIMETHYPHENOL	370	U	370	UG/KG	NIA	1,300,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DINITROPHENOL	930	UJ	930	UG/KG	230,000	130,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DINITROTOLUENE	370	U	370	UG/KG	2,000	130,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2,6-DINITROTOLUENE	370	U	370	UG/KG	120,000	65,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2-CHLORONAPHTHALENE	370	U	370	UG/KG	9,400,000	5,200,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2-CHLOROPHENOL	370	U	370	UG/KG	580,000	330,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2-METHYLNAPHTHALENE	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2-METHYLPHENOL	370	U	370	UG/KG	580,000	3,300,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2-NITROANILINE	930	U	930	UG/KG	7,000	3,900		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	2-NITROPHENOL	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	3,3'-DICHLOROBENZIDINE	370	U	370	UG/KG	3,000	990		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	3-NITROANILINE	930	U	930	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4,6-DINITRO-2-METHYLPHENOL	930	U	930	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-BROMOPHENYL-PHENYLETHER	370	U	370	UG/KG	NR	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-CHLORO-3-METHYLPHENOL	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-CHLOROANILINE	370	U	370	UG/KG	470,000	260,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-CHLOROPHENYL-PHENYLETHER	370	U	370	UG/KG	NR	NR		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-METHYLPHENOL	370	U	370	UG/KG	580,000	330,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-NITROANILINE	930	U	930	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	4-NITROPHENOL	930	U	930	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	ACENAPHTHENE	370	U	370	UG/KG	7,000,000	360,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	ACENAPHTHYLENE	370	U	370	UG/KG	7,000,000	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	ANTHRACENE	370	U	370	UG/KG	35,000,000	19,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(A)ANTHRACENE	370	U	370	UG/KG	1,100	610		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(A)PYRENE	370	U	370	UG/KG	190	61		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(B)FLUORANTHENE	370	U	370	UG/KG	1,100	610		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(G,H,I)PERYLENE	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(K)FLUORANTHENE	370	U	370	UG/KG	1,100	6,100		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BIS(2-CHLOROETHOXY)METHANE	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BIS(2-ETHYLHEXYL)PHTHALATE	370	U	370	UG/KG	97,000	32,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	BUTYL BENZYL PHTHALATE	370	U	370	UG/KG	2,300,000	13,000,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	CARBAZOLE	370	U	370	UG/KG	NIA	22,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	CHRYSENE	370	U	370	UG/KG	110,000	24,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	DI-N-BUTYL PHTHALATE	370	U	370	UG/KG	12,000,000	6,500,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	DI-N-OCTYL PHTHALATE	370	U	370	UG/KG	NR	1,300,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	DIBENZ(A,H)ANTHRACENE	370	U	370	UG/KG	110	61		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	DIBENZOFURAN	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	DIETHYL PHTHALATE	370	U	370	UG/KG	94,000,000	52,000,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	DIMETHY PHTHALATE	370	U	370	UG/KG	NR	100,000,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	FLUORANTHENE	370	U	370	UG/KG	4,700,000	2,600,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	FLUORENE	370	U	370	UG/KG	4,700,000	300,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROBENZENE	370	U	370	UG/KG	850	280		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROBUTADIENE	370	U	370	UG/KG	17,000	5,700		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROCYCLOPENTADIENE	370	R	370	UG/KG	820,000	450,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROETHANE	370	U	370	UG/KG	97,000	32,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	INDENO(1,2,3-CD)PYRENE	370	U	370	UG/KG	1,100	610		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	ISOPHORONE	370	U	370	UG/KG	1,400,000	470,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	N-NITROSO-DI-N-PROPYLAMINE	370	U	370	UG/KG	190	63		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	N-NITROSODIPHENYLAMINE (1)	370	U	370	UG/KG	280,000	91,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	NAPHTHALENE	370	U	370	UG/KG	4,700,000	800,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	NITROBENZENE	370	U	370	UG/KG	58,000	33,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	PENTACHLOROPHENOL	930	U	930	UG/KG	11,000	2,500		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	PHENANTHRENE	370	U	370	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	PHENOL	370	U	370	UG/KG	70,000,000	39,000,000		
ST-25	D2001	7/24/95	SOIL	SVOC	3.75	4.25	PYRENE	370	U	370	UG/KG	3,500,000	2,000,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,1,1-TRICHLOROETHANE	11	U	11	UG/KG	11,000,000	3,200,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,1,2,2-TETRACHLOROETHANE	11	UJ	11	UG/KG	6,800	900		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,1,2-TRICHLOROETHANE	11	U	11	UG/KG	24,000	1,400		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,1-DICHLOROETHANE	11	U	11	UG/KG	1,200,000	840,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,1-DICHLOROETHENE	11	U	11	UG/KG	2,300	38		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,2-DICHLOROETHANE	11	U	11	UG/KG	15,000	440		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,2-DICHLOROETHENE (TOTAL)	11	U	11	UG/KG	2,300,000	NIA		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	1,2-DICHLOROPROPANE	11	U	11	UG/KG	20,000	680		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	2-BUTANONE	11	U	11	UG/KG	70,000,000	8,700,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	2-HEXANONE	11	UJ	11	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	4-METHYL-2-PENTANONE	11	UJ	11	UG/KG	9,400,000	5,200,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	ACETONE	31	UJ	11	UG/KG	12,000,000	2,000,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	BENZENE	11	U	11	UG/KG	47,000	1,400		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	BROMODICHLOROMETHANE	11	U	11	UG/KG	22,000	1,400		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	BROMOFORM	11	U	11	UG/KG	170,000	56,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	BROMOMETHANE	11	U	11	UG/KG	160,000	15,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CARBON DISULFIDE	11	UJ	11	UG/KG	12,000,000	16,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CARBON TETRACHLORIDE	11	U	11	UG/KG	10,000	470		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CHLOROBENZENE	11	UJ	11	UG/KG	2,300,000	160,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CHLOROETHANE	11	U	11	UG/KG	NIA	NIA		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CHLOROFORM	11	U	11	UG/KG	220,000	530		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CHLOROMETHANE	11	U	11	UG/KG	100,000	2,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CIS-1,2-DICHLOROETHENE	11	U	11	UG/KG	1,200,000	59,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	CIS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	DIBROMOCHLOROM[illegible]NE	11	U	11	UG/KG	16,000	5,300		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	ETHYL BENZENE	11	UJ	11	UG/KG	12,000,000	2,900,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	METHYLENE CHLORIDE	2	J	11	UG/KG	180,000	11,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	STYRENE	11	UJ	11	UG/KG	2,300,000	2,200,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	TETRACHLOROETHENE	11	UJ	11	UG/KG	27,000	7,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	TOLUENE	11	UJ	11	UG/KG	23,000,000	1,900,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	TRANS-1,2-DICHLOROETHENE	11	U	11	UG/KG	2,300,000	170,000		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	TRANS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	TRICHLOROETHENE	11	U	11	UG/KG	120,000	7,100		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	VINYL CHLORIDE	11	U	11	UG/KG	720	5.2		
ST-25	D2001	7/24/95	SOIL	VOC	3.75	4.25	XYLENE (TOTAL)	11	UJ	11	UG/KG	230,000,000	980,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	1,2,4-TRICHLOROBENZENE	380	U	380	UG/KG	1,200,000	620,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	1,2-DICHLOROBENZENE	380	U	380	UG/KG	11,000,000	2,300,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	1,3-DICHLOROBENZENE	380	U	380	UG/KG	10,000,000	2,800,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	1,4-DICHLOROBENZENE	380	U	380	UG/KG	57,000	7,400		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,4,5-TRICHLOROPHENOL	950	U	950	UG/KG	12,000,000	6,500,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,4,6-TRICHLOROPHENOL	380	U	380	UG/KG	120,000	40,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DICHLOROPHENOL	380	U	380	UG/KG	350,000	200,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DIMETHYPHENOL	380	U	380	UG/KG	NIA	1,300,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DINITROPHENOL	950	UJ	950	UG/KG	230,000	130,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,4-DINITROTOLUENE	380	U	380	UG/KG	2,000	130,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2,6-DINITROTOLUENE	380	U	380	UG/KG	120,000	65,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2-CHLORONAPHTHALENE	380	U	380	UG/KG	9,400,000	5,200,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2-CHLOROPHENOL	380	U	380	UG/KG	580,000	330,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2-METHYLNAPHTHALENE	380	U	380	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2-METHYLPHENOL	380	U	380	UG/KG	580,000	3,300,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2-NITROANILINE	950	U	950	UG/KG	7,000	3,900		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	2-NITROPHENOL	380	U	380	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	3,3'-DICHLOROBENZIDINE	380	U	380	UG/KG	3,000	990		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	3-NITROANILINE	950	U	950	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4,6-DINITRO-2-METHYLPHENOL	950	U	950	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-BROMOPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-CHLORO-3-METHYLPHENOL	380	U	380	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-CHLOROANILINE	380	U	380	UG/KG	470,000	260,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-CHLOROPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NR		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-METHYLPHENOL	380	U	380	UG/KG	580,000	330,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-NITROANILINE	950	U	950	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	4-NITROPHENOL	950	U	950	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	ACENAPHTHENE	380	U	380	UG/KG	7,000,000	360,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	ACENAPHTHYLENE	380	U	380	UG/KG	7,000,000	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	ANTHRACENE	380	U	380	UG/KG	35,000,000	19,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(A)ANTHRACENE	380	U	380	UG/KG	1,100	610		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(A)PYRENE	380	U	380	UG/KG	190	61		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(B)FLUORANTHENE	380	U	380	UG/KG	1,100	610		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(G,H,I)PERYLENE	380	U	380	UG/KG	NIA	NIA		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BENZO(K)FLUORANTHENE	380	U	380	UG/KG	1,100	6,100		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BIS(2-CHLOROETHOXY)METHANE	380	U	380	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BIS(2-CHLOROETHYL)ETHER	380	U	380	UG/KG	1,200	74		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BIS(2-ETHYLHEXYL)PHTHALATE	380	U	380	UG/KG	97,000	32,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	BUTYL BENZYL PHTHALATE	380	U	380	UG/KG	2,300,000	13,000,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	CARBAZOLE	380	U	380	UG/KG	NIA	22,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	CHRYSENE	380	U	380	UG/KG	110,000	24,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	DI-N-BUTYL PHTHALATE	380	U	380	UG/KG	12,000,000	6,500,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	DI-N-OCTYL PHTHALATE	380	U	380	UG/KG	NR	1,300,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	DIBENZ(A,H)ANTHRACENE	380	U	380	UG/KG	110	61		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	DIBENZOFURAN	380	U	380	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	DIETHYL PHTHALATE	380	U	380	UG/KG	94,000,000	52,000,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	DIMETHY PHTHALATE	380	U	380	UG/KG	NR	100,000,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	FLUORANTHENE	380	U	380	UG/KG	4,700,000	2,600,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	FLUORENE	380	U	380	UG/KG	4,700,000	300,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROBENZENE	380	U	380	UG/KG	850	280		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROBUTADIENE	380	U	380	UG/KG	17,000	5,700		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROCYCLOPENTADIENE	380	R	380	UG/KG	820,000	450,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	HEXACHLOROETHANE	380	U	380	UG/KG	97,000	32,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	INDENO(1,2,3-CD)PYRENE	380	U	380	UG/KG	1,100	610		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	ISOPHORONE	380	U	380	UG/KG	1,400,000	470,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	N-NITROSO-DI-N-PROPYLAMINE	380	U	380	UG/KG	190	63		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	N-NITROSODIPHENYLAMINE (1)	380	U	380	UG/KG	280,000	91,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	NAPHTHALENE	380	U	380	UG/KG	4,700,000	800,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	NITROBENZENE	380	U	380	UG/KG	58,000	33,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	PENTACHLOROPHENOL	950	U	950	UG/KG	11,000	2,500		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	PHENANTHRENE	380	U	380	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	PHENOL	380	U	380	UG/KG	70,000,000	39,000,000		
ST-25	D2002 (dup)	7/24/95	SOIL	SVOC	3.75	4.25	PYRENE	380	U	380	UG/KG	3,500,000	2,000,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,1,1-TRICHLOROETHANE	11	U	11	UG/KG	11,000,000	3,200,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,1,2,2-TETRACHLOROETHANE	11	U	11	UG/KG	6,800	900		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,1,2-TRICHLOROETHANE	11	U	11	UG/KG	24,000	1,400		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,1-DICHLOROETHANE	11	U	11	UG/KG	1,200,000	840,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,1-DICHLOROETHENE	11	U	11	UG/KG	2,300	38		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,2-DICHLOROETHANE	11	U	11	UG/KG	15,000	440		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,2-DICHLOROETHENE (TOTAL)	11	U	11	UG/KG	2,300,000	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	1,2-DICHLOROPROPANE	11	U	11	UG/KG	20,000	680		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	2-BUTANONE	11	U	11	UG/KG	70,000,000	8,700,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	2-HEXANONE	11	U	11	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	4-METHYL-2-PENTANONE	11	U	11	UG/KG	9,400,000	5,200,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	ACETONE	11	UJ	11	UG/KG	12,000,000	2,000,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	BENZENE	11	U	11	UG/KG	47,000	1,400		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	BROMODICHLOROMETHANE	11	U	11	UG/KG	22,000	1,400		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	BROMOFORM	11	U	11	UG/KG	170,000	56,000		

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OU-5 Remedial Investigation
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	BROMOMETHANE	11	U	11	UG/KG	160,000	15,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CARBON DISULFIDE	11	UJ	11	UG/KG	12,000,000	16,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CARBON TETRACHLORIDE	11	U	11	UG/KG	10,000	470		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CHLOROBENZENE	11	U	11	UG/KG	2,300,000	160,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CHLOROETHANE	11	U	11	UG/KG	NIA	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CHLOROFORM	11	U	11	UG/KG	220,000	530		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CHLOROMETHANE	11	U	11	UG/KG	100,000	2,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CIS-1,2-DICHLOROETHENE	11	U	11	UG/KG	1,200,000	59,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	CIS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	DIBROMOCHLOROMETHANE	11	U	11	UG/KG	16,000	5,300		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	ETHYL BENZENE	11	U	11	UG/KG	12,000,000	2,900,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	METHYLENE CHLORIDE	3	J	11	UG/KG	180,000	11,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	STYRENE	11	U	11	UG/KG	2,300,000	2,200,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	TETRACHLOROETHENE	11	U	11	UG/KG	27,000	7,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	TOLUENE	11	U	11	UG/KG	23,000,000	1,900,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	TRANS-1,2-DICHLOROETHENE	11	U	11	UG/KG	2,300,000	170,000		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	TRANS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	TRICHLOROETHENE	11	U	11	UG/KG	120,000	7,100		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	VINYL CHLORIDE	11	U	11	UG/KG	720	5.2		
ST-25	D2002 (dup)	7/24/95	SOIL	VOC	3.75	4.25	XYLENE (TOTAL)	11	U	11	UG/KG	230,000,000	980,000		
PAINT SHOP LEACH FIELD, WP-27															
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	ANTIMONY	9.3	R	9.3	MG/KG	47	31		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	ARSENIC	7.7		0.72	MG/KG	0.91	0.32		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	BERYLLIUM	0.49	J	0.24	MG/KG	0.32	0.14		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	CADMIUM	1.8	J	1.2	MG/KG	58	38		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	CHROMIUM	25.2		1.9	MG/KG	580	210		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	COPPER	61.1		1.4	MG/KG	4,300	2,800		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	LEAD	18.3		0.48	MG/KG	400	400		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	MERCURY	0.12	U	0.12	MG/KG	35	23		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	NICKEL	29.5		4.5	MG/KG	2,300	1,500		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	SELENIUM	0.72	UJ	0.72	MG/KG	580	380		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	SILVER	1.7	U	1.7	MG/KG	580	380		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	THALLIUM	1	J	0.72	MG/KG	8.2	NIA		
WP-27	D2003	7/21/95	SOIL	METAL	3	3.5	ZINC	149		0.95	MG/KG	35,000	23,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	400	U	400	UG/KG	1,200,000	620,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	400	U	400	UG/KG	11,000,000	2,300,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	400	U	400	UG/KG	10,000,000	2,800,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	400	U	400	UG/KG	57,000	7,400		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	990	U	990	UG/KG	12,000,000	6,500,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	400	U	400	UG/KG	120,000	40,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	400	U	400	UG/KG	350,000	200,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	400	U	400	UG/KG	NIA	1,300,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	990	UJ	990	UG/KG	230,000	130,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	400	U	400	UG/KG	2,000	130,000		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	400	U	400	UG/KG	120,000	65,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	400	U	400	UG/KG	9,400,000	5,200,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	400	U	400	UG/KG	580,000	330,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	400	U	400	UG/KG	580,000	3,300,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2-NITROANILINE	990	U	990	UG/KG	7,000	3,900		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	400	U	400	UG/KG	3,000	990		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	3-NITROANILINE	990	U	990	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	990	U	990	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	400	U	400	UG/KG	NR	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYLPHENOL	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	400	U	400	UG/KG	470,000	260,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	400	U	400	UG/KG	NR	NR		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	400	U	400	UG/KG	580,000	330,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-NITROANILINE	990	U	990	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	990	U	990	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	400	U	400	UG/KG	7,000,000	360,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	400	U	400	UG/KG	7,000,000	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	ANTHRACENE	400	U	400	UG/KG	35,000,000	19,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	400	U	400	UG/KG	1,100	610		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	400	U	400	UG/KG	190	61		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	400	U	400	UG/KG	1,100	610		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	400	U	400	UG/KG	1,100	6,100		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	400	U	400	UG/KG	1,200	74		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	400	U	400	UG/KG	97,000	32,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	400	U	400	UG/KG	2,300,000	13,000,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	CARBAZOLE	400	U	400	UG/KG	NIA	22,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	CHRYSENE	400	U	400	UG/KG	110,000	24,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHALATE	400	U	400	UG/KG	12,000,000	6,500,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	400	U	400	UG/KG	NR	1,300,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	400	U	400	UG/KG	110	61		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	6	U	6	MG/KG	NR	NR		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DIETHYL PHTHALATE	400	U	400	UG/KG	94,000,000	52,000,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	400	U	400	UG/KG	NR	100,000,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	FLUORANTHENE	400	U	400	UG/KG	4,700,000	2,600,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	FLUORENE	400	U	400	UG/KG	4,700,000	300,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	400	U	400	UG/KG	850	280		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	400	R	400	UG/KG	17,000	5,700		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	400	U	400	UG/KG	820,000	450,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	HEXACHLOROET	400	U	400	UG/KG	97,000	32,000		

Appendix A
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OU-5 Remedial Investigation
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	400	U	400	UG/KG	1,100	610		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	ISOPHORONE	400	U	400	UG/KG	1,400,000	470,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	400	U	400	UG/KG	190	63		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	400	U	400	UG/KG	280,000	91,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	NAPHTHALENE	400	U	400	UG/KG	4,700,000	800,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	NITROBENZENE	400	U	400	UG/KG	58,000	33,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	990	U	990	UG/KG	11,000	2,500		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	PHENANTHRENE	400	U	400	UG/KG	NIA	NIA		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	PHENOL	400	U	400	UG/KG	70,000,000	39,000,000		
WP-27	D2003	7/21/95	SOIL	SVOC	3	3.5	PYRENE	400	U	400	UG/KG	3,500,000	2,000,000		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	ANTIMONY	9.1	R	9.1	MG/KG	47	31		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	ARSENIC	5.9		0.7	MG/KG	0.91	0.32		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	BERYLLIUM	0.23	U	0.23	MG/KG	0.32	0.14		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	CADMIUM	1.2	U	1.2	MG/KG	58	38		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	CHROMIUM	23.9		1.9	MG/KG	580	210		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	COPPER	32.5		1.4	MG/KG	4,300	2,800		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	LEAD	18.2		0.47	MG/KG	400	400		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	MERCURY	0.12	U	0.12	MG/KG	35	23		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	NICKEL	18		4.4	MG/KG	2,300	1,500		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	SELENIUM	0.7	U	0.7	MG/KG	580	380		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	SILVER	1.6	U	1.6	MG/KG	580	380		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	THALLIUM	0.7	U	0.7	MG/KG	8.2	NIA		
WP-27	D2004 (dup)	7/21/95	SOIL	METAL	4.5	5	ZINC	86.5		0.93	MG/KG	35,000	23,000		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	ANTIMONY	9.1	R	9.1	MG/KG	47	31		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	ARSENIC	9.6		0.7	MG/KG	0.91	0.32		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	BERYLLIUM	0.43	J	0.23	MG/KG	0.32	0.14		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	CADMIUM	1.2	U	1.2	MG/KG	58	38		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	CHROMIUM	24.6		1.9	MG/KG	580	210		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	COPPER	48.1		1.4	MG/KG	4,300	2,800		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	LEAD	18.5		0.47	MG/KG	400	400		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	MERCURY	0.12	U	0.12	MG/KG	35	23		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	NICKEL	21.6	J	4.4	MG/KG	2,300	1,500		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	SELENIUM	0.86	J	0.7	MG/KG	580	380		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	SILVER	1.6	U	1.6	MG/KG	580	380		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	THALLIUM	0.7	UJ	0.7	MG/KG	8.2	NIA		
WP-27	D2005	7/21/95	SOIL	METAL	5	5.5	ZINC	122		0.94	MG/KG	35,000	23,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	1,2,4-TRICHLOROBENZENE	390	U	390	UG/KG	1,200,000	620,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	1,2-DICHLOROBENZENE	390	U	390	UG/KG	11,000,000	2,300,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	1,3-DICHLOROBENZENE	390	U	390	UG/KG	10,000,000	2,800,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	1,4-DICHLOROBENZENE	390	U	390	UG/KG	57,000	7,400		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,4,5-TRICHLOROPHENOL	970	U	970	UG/KG	12,000,000	6,500,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,4,6-TRICHLOROPHENOL	390	U	390	UG/KG	120,000	40,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,4-DICHLOROPHENOL	390	U	390	UG/KG	350,000	200,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,4-DIMETHYPHENOL	390	U	390	UG/KG	NIA	1,300,000		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,4-DINITROPHENOL	970	UJ	970	UG/KG	230,000	130,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,4-DINITROTOLUENE	390	U	390	UG/KG	2,000	130,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2,6-DINITROTOLUENE	390	U	390	UG/KG	120,000	65,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2-CHLORONAPHTHALENE	390	U	390	UG/KG	9,400,000	5,200,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2-CHLOROPHENOL	390	U	390	UG/KG	580,000	330,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2-METHYLNAPHTHALENE	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2-METHYLPHENOL	390	U	390	UG/KG	580,000	3,300,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2-NITROANILINE	970	U	970	UG/KG	7,000	3,900		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	2-NITROPHENOL	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	3,3'-DICHLOROBENZIDINE	390	U	390	UG/KG	3,000	990		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	3-NITROANILINE	970	U	970	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4,6-DINITRO-2-METHYLPHENOL	970	U	970	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-BROMOPHENYL-PHENYLETHER	390	U	390	UG/KG	NR	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-CHLORO-3-METHYLPHENOL	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-CHLOROANILINE	390	U	390	UG/KG	470,000	260,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-CHLOROPHENYL-PHENYLETHER	390	U	390	UG/KG	NR	NR		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-METHYLPHENOL	390	U	390	UG/KG	580,000	330,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-NITROANILINE	970	U	970	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	4-NITROPHENOL	970	U	970	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	ACENAPHTHENE	390	U	390	UG/KG	7,000,000	360,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	ACENAPHTHYLENE	390	U	390	UG/KG	7,000,000	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	ANTHRACENE	390	U	390	UG/KG	35,000,000	19,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BENZO(A)ANTHRACENE	390	U	390	UG/KG	1,100	610		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BENZO(A)PYRENE	390	U	390	UG/KG	190	61		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BENZO(B)FLUORANTHENE	390	U	390	UG/KG	1,100	610		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BENZO(G,H,I)PERYLENE	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BENZO(K)FLUORANTHENE	390	U	390	UG/KG	1,100	6,100		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BIS(2-CHLOROETHOXY)METHANE	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BIS(2-CHLOROETHYL)ETHER	390	U	390	UG/KG	1,200	74		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BIS(2-ETHYLHEXYL)PHTHALATE	390	U	390	UG/KG	97,000	32,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	BUTYL BENZYL PHTHALATE	390	U	390	UG/KG	2,300,000	13,000,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	CARBAZOLE	390	U	390	UG/KG	NIA	22,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	CHRYSENE	390	U	390	UG/KG	110,000	24,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DI-N-BUTYL PHTHALATE	390	U	390	UG/KG	12,000,000	6,500,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DI-N-OCTYL PHTHALATE	390	U	390	UG/KG	NR	1,300,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DIBENZ(A,H)ANTHRACENE	390	U	390	UG/KG	110	61		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DIBENZOFURAN	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DIESEL RANGE ORGANICS	5.8	U	5.8	MG/KG	NR	NR		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DIETHYL PHTHALATE	390	U	390	UG/KG	94,000,000	52,000,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	DIMETHY PHTHALATE	390	U	390	UG/KG	NR	100,000,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	FLUORANTHENE	390	U	390	UG/KG	4,700,000	2,600,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	FLUORENE	390	U	390	UG/KG	4,700,000	300,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	HEXACHLOROBENZENE	390	U	390	UG/KG	850	280		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	HEXACHLOROBUTA[illegible]E	390	U	390	UG/KG	17,000	5,700		

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OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	HEXACHLOROCYCLOPENTADIENE	390	R	390	UG/KG	820,000	450,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	HEXACHLOROETHANE	390	U	390	UG/KG	97,000	32,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	INDENO(1,2,3-CD)PYRENE	390	U	390	UG/KG	1,100	610		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	ISOPHORONE	390	U	390	UG/KG	1,400,000	470,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	N-NITROSO-DI-N-PROPYLAMINE	390	U	390	UG/KG	190	63		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	N-NITROSODIPHENYLAMINE (1)	390	U	390	UG/KG	280,000	91,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	NAPHTHALENE	390	U	390	UG/KG	4,700,000	800,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	NITROBENZENE	390	U	390	UG/KG	58,000	33,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	PENTACHLOROPHENOL	970	U	970	UG/KG	11,000	2,500		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	PHENANTHRENE	390	U	390	UG/KG	NIA	NIA		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	PHENOL	390	U	390	UG/KG	70,000,000	39,000,000		
WP-27	D2005	7/21/95	SOIL	SVOC	5	5.5	PYRENE	390	U	390	UG/KG	3,500,000	2,000,000		
PRIME BEEF YARD, SS-29															
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	ANTIMONY	8.9	R	8.9	MG/KG	47	31		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	ARSENIC	5.2	J	0.68	MG/KG	0.91	0.32		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	BERYLLIUM	0.78	J	0.23	MG/KG	0.32	0.14		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	CADMIUM	1.1	U	1.1	MG/KG	58	38		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	CHROMIUM	29.6		1.8	MG/KG	580	210		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	COPPER	155		1.4	MG/KG	4,300	2,800		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	LEAD	21.4		0.46	MG/KG	400	400		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	MERCURY	0.11	U	0.11	MG/KG	35	23		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	NICKEL	29.1		4.3	MG/KG	2,300	1,500		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	SELENIUM	1.7	J	0.68	MG/KG	580	380		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	SILVER	1.6	U	1.6	MG/KG	580	380		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	THALLIUM	1.1	J	0.68	MG/KG	8.2	NIA		
SS-29	D2006	7/26/95	SOIL	METAL	3	3.5	ZINC	232		0.91	MG/KG	35,000	23,000		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	4,4'-DDD	3.8	U	3.8	UG/KG	5,700	1,900		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	4,4'-DDE	3.8	U	3.8	UG/KG	4,000	1,300		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	4,4'-DDT	3.8	U	3.8	UG/KG	4,000	1,300		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aldrin	1.9	U	1.9	UG/KG	80	26		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	alpha-BHC	1.9	U	1.9	UG/KG	220	71		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	alpha-Chlordane	1.9	U	1.9	UG/KG	1,000	340		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1016	38	U	38	UG/KG	8,200	4,900		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1221	76	U	76	UG/KG	180	1,400		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1232	38	U	38	UG/KG	180	1,400		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1242	38	U	38	UG/KG	180	1,400		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1248	38	U	38	UG/KG	180	1,400		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1254	38	U	38	UG/KG	180	1,400		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1260	38	U	38	UG/KG	180	1,400		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	beta-BHC	1.9	U	1.9	UG/KG	760	250		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	delta-BHC	1.9	U	1.9	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Dieldrin	3.8	U	3.8	UG/KG	90	28		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Endosulfan I	1.9	U	1.9	UG/KG	5,800	NIA		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Endosulfan II	3.8	U	3.8	UG/KG	NIA	NIA		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Endosulfan sulfate	3.8	U	3.8	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Endrin	3.8	U	3.8	UG/KG	35,000	20,000		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Endrin ketone	3.8	U	3.8	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	gamma-BHC (Lindane)	1.9	U	1.9	UG/KG	1,000	340		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	gamma-Chlordane	1.9	U	1.9	UG/KG	1,000	340		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Heptachlor	1.9	U	1.9	UG/KG	300	99		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Heptachlor epoxide	1.9	U	1.9	UG/KG	150	49		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Methoxychlor	19	U	19	UG/KG	580,000	330,000		
SS-29	D2006	7/26/95	SOIL	PESTPCB	3	3.5	Toxaphene	190	U	190	UG/KG	1,200	400		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	380	U	380	UG/KG	1,200,000	620,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	380	U	380	UG/KG	11,000,000	2,300,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	380	U	380	UG/KG	10,000,000	2,800,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	380	U	380	UG/KG	57,000	7,400		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	940	U	940	UG/KG	12,000,000	6,500,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	380	U	380	UG/KG	120,000	40,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	380	U	380	UG/KG	350,000	200,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	380	U	380	UG/KG	NIA	1,300,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	940	UJ	940	UG/KG	230,000	130,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	380	U	380	UG/KG	2,000	130,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	380	U	380	UG/KG	120,000	65,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	380	U	380	UG/KG	9,400,000	5,200,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	380	U	380	UG/KG	580,000	330,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	380	U	380	UG/KG	580,000	3,300,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2-NITROANILINE	940	U	940	UG/KG	7,000	3,900		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	380	U	380	UG/KG	3,000	990		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	3-NITROANILINE	940	U	940	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	940	U	940	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYLPHENOL	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	380	U	380	UG/KG	470,000	260,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NR		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	380	U	380	UG/KG	580,000	330,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-NITROANILINE	940	U	940	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	940	U	940	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	380	U	380	UG/KG	7,000,000	360,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	380	U	380	UG/KG	7,000,000	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	ANTHRACENE	380	U	380	UG/KG	35,000,000	19,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	380	U	380	UG/KG	1,100	610		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	380	U	380	UG/KG	190	61		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	380	U	380	UG/KG	1,100	610		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	380	U	380	UG/KG	1,100	6,100		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	380	U	380	UG/KG	1,200	74		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	380	U	380	UG/KG	97,000	32,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	380	U	380	UG/KG	2,300,000	13,000,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	CARBAZOLE	380	U	380	UG/KG	NIA	22,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	CHRYSENE	380	U	380	UG/KG	110,000	24,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHALATE	380	U	380	UG/KG	12,000,000	6,500,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	380	U	380	UG/KG	NR	1,300,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	380	U	380	UG/KG	110	61		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	5.7	U	5.7	MG/KG	NR	NR		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DIETHYL PHTHALATE	380	U	380	UG/KG	94,000,000	52,000,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	380	U	380	UG/KG	NR	100,000,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	FLUORANTHENE	380	U	380	UG/KG	4,700,000	2,600,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	FLUORENE	380	U	380	UG/KG	4,700,000	300,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	380	U	380	UG/KG	850	280		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	380	U	380	UG/KG	17,000	5,700		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	380	R	380	UG/KG	820,000	450,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROETHANE	380	U	380	UG/KG	97,000	32,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	380	U	380	UG/KG	1,100	610		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	ISOPHORONE	380	U	380	UG/KG	1,400,000	470,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	380	U	380	UG/KG	190	63		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	380	U	380	UG/KG	280,000	91,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	NAPHTHALENE	380	U	380	UG/KG	4,700,000	800,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	NITROBENZENE	380	U	380	UG/KG	58,000	33,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	940	U	940	UG/KG	11,000	2,500		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	PHENANTHRENE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	PHENOL	380	U	380	UG/KG	70,000,000	39,000,000		
SS-29	D2006	7/26/95	SOIL	SVOC	3	3.5	PYRENE	380	U	380	UG/KG	3,500,000	2,000,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,1,1-TRICHLOROETHANE	11	U	11	UG/KG	11,000,000	3,200,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,1,2,2-TETRACHLOROETHANE	11	U	11	UG/KG	6,800	900		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,1,2-TRICHLOROETHANE	11	U	11	UG/KG	24,000	1,400		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,1-DICHLOROETHANE	11	U	11	UG/KG	1,200,000	840,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,1-DICHLOROETHENE	11	U	11	UG/KG	2,300	38		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROETHANE	11	U	11	UG/KG	15,000	440		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROETHENE (TOTAL)	11	U	11	UG/KG	2,300,000	NIA		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROPROPANE	11	U	11	UG/KG	20,000	680		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	2-BUTANONE	11	U	11	UG/KG	70,000,000	8,700,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	2-HEXANONE	11	U	11	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	4-METHYL-2-PENTANONE	11	U	11	UG/KG	9,400,000	5,200,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	ACETONE	44	UJ	11	UG/KG	12,000,000	2,000,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	BENZENE	11	U	11	UG/KG	47,000	1,400		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	BROMODICHLOROMETHANE	11	U	11	UG/KG	22,000	1,400		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	BROMOFORM	11	U	11	UG/KG	170,000	56,000		

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Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	BROMOMETHANE	11	U	11	UG/KG	160,000	15,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CARBON DISULFIDE	11	UJ	11	UG/KG	12,000,000	16,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CARBON TETRACHLORIDE	11	U	11	UG/KG	10,000	470		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CHLOROBENZENE	11	U	11	UG/KG	2,300,000	160,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CHLOROETHANE	11	U	11	UG/KG	NIA	NIA		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CHLOROFORM	11	U	11	UG/KG	220,000	530		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CHLOROMETHANE	11	U	11	UG/KG	100,000	2,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CIS-1,2-DICHLOROETHENE	11	U	11	UG/KG	1,200,000	59,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	CIS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	DIBROMOCHLOROMETHANE	11	U	11	UG/KG	16,000	5,300		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	ETHYL BENZENE	11	U	11	UG/KG	12,000,000	2,900,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	METHYLENE CHLORIDE	4	J	11	UG/KG	180,000	11,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	STYRENE	11	U	11	UG/KG	2,300,000	2,200,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	TETRACHLOROETHENE	11	U	11	UG/KG	27,000	7,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	TOLUENE	11	U	11	UG/KG	23,000,000	1,900,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	TRANS-1,2-DICHLOROETHENE	11	U	11	UG/KG	2,300,000	170,000		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	TRANS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	TRICHLOROETHENE	11	U	11	UG/KG	120,000	7,100		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	VINYL CHLORIDE	11	U	11	UG/KG	720	5.2		
SS-29	D2006	7/26/95	SOIL	VOC	3	3.5	XYLENE (TOTAL)	11	U	11	UG/KG	230,000,000	980,000		
SS-29	D2007	7/26/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	5.8	U	5.8	MG/KG	NR	NR		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	ANTIMONY	8.6	R	8.6	MG/KG	47	31		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	ARSENIC	6.3	J	0.66	MG/KG	0.91	0.32		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	BERYLLIUM	0.58	J	0.22	MG/KG	0.32	0.14		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	CADMIUM	1.1	U	1.1	MG/KG	58	38		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	CHROMIUM	35.2		1.8	MG/KG	580	210		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	COPPER	79.5		1.3	MG/KG	4,300	2,800		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	LEAD	22.6		0.44	MG/KG	400	400		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	MERCURY	0.11	U	0.11	MG/KG	35	23		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	NICKEL	30.1	J	4.2	MG/KG	2,300	1,500		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	SELENIUM	0.9	J	0.66	MG/KG	580	380		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	SILVER	1.5	U	1.5	MG/KG	580	380		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	THALLIUM	0.66	UJ	0.66	MG/KG	8.2	NIA		
SS-29	D2008	7/26/95	SOIL	METAL	3	3.5	ZINC	164		0.88	MG/KG	35,000	23,000		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	4,4'-DDD	3.6	U	3.6	UG/KG	5,700	1,900		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	4,4'-DDE	3.6	U	3.6	UG/KG	4,000	1,300		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	4,4'-DDT	3.6	U	3.6	UG/KG	4,000	1,300		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aldrin	1.9	U	1.9	UG/KG	80	26		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	alpha-BHC	1.9	U	1.9	UG/KG	220	71		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	alpha-Chlordane	1.9	U	1.9	UG/KG	1,000	340		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1016	36	U	36	UG/KG	8,200	4,900		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1221	73	U	73	UG/KG	180	1,400		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1232	36	U	36	UG/KG	180	1,400		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1242	36	U	36	UG/KG	180	1,400		

Appendix A
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1248	36	U	36	UG/KG	180	1,400		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1254	36	U	36	UG/KG	180	1,400		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Aroclor-1260	36	U	36	UG/KG	180	1,400		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	beta-BHC	1.9	U	1.9	UG/KG	760	250		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	delta-BHC	1.9	U	1.9	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Dieldrin	3.6	U	3.6	UG/KG	90	28		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Endosulfan I	1.9	U	1.9	UG/KG	5,800	NIA		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Endosulfan II	3.6	U	3.6	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Endosulfan sulfate	3.6	U	3.6	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Endrin	3.6	U	3.6	UG/KG	35,000	20,000		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Endrin ketone	3.6	U	3.6	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	gamma-BHC (Lindane)	1.9	U	1.9	UG/KG	1,000	340		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	gamma-Chlordane	1.9	U	1.9	UG/KG	1,000	340		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Heptachlor	1.9	U	1.9	UG/KG	300	99		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Heptachlor epoxide	1.9	U	1.9	UG/KG	150	49		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Methoxychlor	19	U	19	UG/KG	580,000	330,000		
SS-29	D2008	7/26/95	SOIL	PESTPCB	3	3.5	Toxaphene	190	U	190	UG/KG	1,200	400		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	360	U	360	UG/KG	1,200,000	620,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	360	U	360	UG/KG	11,000,000	2,300,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	360	U	360	UG/KG	10,000,000	2,800,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	360	U	360	UG/KG	57,000	7,400		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	910	U	910	UG/KG	12,000,000	6,500,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	360	U	360	UG/KG	120,000	40,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	360	U	360	UG/KG	350,000	200,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	360	U	360	UG/KG	NIA	1,300,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	910	UJ	910	UG/KG	230,000	130,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	360	U	360	UG/KG	2,000	130,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	360	U	360	UG/KG	120,000	65,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	360	U	360	UG/KG	9,400,000	5,200,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	360	U	360	UG/KG	580,000	330,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	360	U	360	UG/KG	580,000	3,300,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2-NITROANILINE	910	U	910	UG/KG	7,000	3,900		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	360	U	360	UG/KG	3,000	990		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	3-NITROANILINE	910	U	910	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	910	U	910	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	360	U	360	UG/KG	NR	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYLPHENOL	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	360	U	360	UG/KG	470,000	260,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	360	U	360	UG/KG	NR	NR		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	360	U	360	UG/KG	580,000	330,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-NITROANILINE	910	U	910	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	910	U	910	UG/KG	NIA	NIA		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	360	U	360	UG/KG	7,000,000	360,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	360	U	360	UG/KG	7,000,000	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	ANTHRACENE	360	U	360	UG/KG	35,000,000	19,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	360	U	360	UG/KG	1,100	610		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	360	U	360	UG/KG	190	61		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	360	U	360	UG/KG	1,100	610		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	360	U	360	UG/KG	1,100	6,100		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	360	U	360	UG/KG	1,200	74		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	360	U	360	UG/KG	97,000	32,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	360	U	360	UG/KG	2,300,000	13,000,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	CARBAZOLE	360	U	360	UG/KG	NIA	22,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	CHRYSENE	360	U	360	UG/KG	110,000	24,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHALATE	360	U	360	UG/KG	12,000,000	6,500,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	360	U	360	UG/KG	NR	1,300,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	360	U	360	UG/KG	110	61		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	5.5	U	5.5	MG/KG	NR	NR		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DIETHYL PHTHALATE	360	U	360	UG/KG	94,000,000	52,000,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	360	U	360	UG/KG	NR	100,000,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	FLUORANTHENE	360	U	360	UG/KG	4,700,000	2,600,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	FLUORENE	360	U	360	UG/KG	4,700,000	300,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	360	U	360	UG/KG	850	280		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	360	U	360	UG/KG	17,000	5,700		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	360	R	360	UG/KG	820,000	450,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROETHANE	360	U	360	UG/KG	97,000	32,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	360	U	360	UG/KG	1,100	610		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	ISOPHORONE	360	U	360	UG/KG	1,400,000	470,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	360	U	360	UG/KG	190	63		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	360	U	360	UG/KG	280,000	91,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	NAPHTHALENE	360	U	360	UG/KG	4,700,000	800,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	NITROBENZENE	360	U	360	UG/KG	58,000	33,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	910	U	910	UG/KG	11,000	2,500		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	PHENANTHRENE	360	U	360	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	PHENOL	360	U	360	UG/KG	70,000,000	39,000,000		
SS-29	D2008	7/26/95	SOIL	SVOC	3	3.5	PYRENE	360	U	360	UG/KG	3,500,000	2,000,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,1,1-TRICHLOROETHANE	11	U	11	UG/KG	11,000,000	3,200,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,1,2,2-TETRACHLOROETHANE	11	U	11	UG/KG	6,800	900		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,1,2-TRICHLOROETHANE	11	U	11	UG/KG	24,000	1,400		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,1-DICHLOROETHANE	11	U	11	UG/KG	1,200,000	840,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,1-DICHLOROETHENE	11	UJ	11	UG/KG	2,300	38		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROETHANE	11	U	11	UG/KG	15,000	440		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROETHENE (TOTAL)	11	U	11	UGKG	2,300,000	NIA		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROPROPANE	11	U	11	UG/KG	20,000	680		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	2-BUTANONE	11	U	11	UG/KG	70,000,000	8,700,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	2-HEXANONE	11	U	11	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	4-METHYL-2-PENTANONE	11	U	11	UG/KG	9,400,000	5,200,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	ACETONE	13	UJ	11	UG/KG	12,000,000	2,000,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	BENZENE	11	U	11	UG/KG	47,000	1,400		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	BROMODICHLOROMETHANE	11	U	11	UG/KG	22,000	1,400		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	BROMOFORM	11	U	11	UG/KG	170,000	56,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	BROMOMETHANE	11	UJ	11	UG/KG	160,000	15,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CARBON DISULFIDE	11	UJ	11	UG/KG	12,000,000	16,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CARBON TETRACHLORIDE	11	U	11	UG/KG	10,000	470		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CHLOROBENZENE	11	U	11	UG/KG	2,300,000	160,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CHLOROETHANE	11	U	11	UG/KG	NIA	NIA		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CHLOROFORM	11	U	11	UG/KG	220,000	530		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CHLOROMETHANE	11	U	11	UG/KG	100,000	2,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CIS-1,2-DICHLOROETHENE	11	U	11	UG/KG	1,200,000	59,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	CIS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	DIBROMOCHLOROMETHANE	11	U	11	UG/KG	16,000	5,300		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	ETHYL BENZENE	11	U	11	UG/KG	12,000,000	2,900,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	METHYLENE CHLORIDE	11	UJ	11	UG/KG	180,000	11,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	STYRENE	11	U	11	UG/KG	2,300,000	2,200,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	TETRACHLOROETHENE	11	U	11	UG/KG	27,000	7,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	TOLUENE	11	U	11	UG/KG	23,000,000	1,900,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	TRANS-1,2-DICHLOROETHENE	11	U	11	UG/KG	2,300,000	170,000		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	TRANS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	TRICHLOROETHENE	11	U	11	UG/KG	120,000	7,100		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	VINYL CHLORIDE	11	U	11	UG/KG	720	5.2		
SS-29	D2008	7/26/95	SOIL	VOC	3	3.5	XYLENE (TOTAL)	11	U	11	UG/KG	230,000,000	980,000		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	ANTIMONY	8.9	R	8.9	MG/KG	47	31		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	ARSENIC	5.2	J	0.69	MG/KG	0.91	0.32		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	BERYLLIUM	0.58	J	0.23	MG/KG	0.32	0.14		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	CADMIUM	1.1	U	1.1	MG/KG	58	38		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	CHROMIUM	28.1		1.8	MG/KG	580	210		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	COPPER	102		1.4	MG/KG	4,300	2,800		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	LEAD	20.8		0.46	MG/KG	400	400		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	MERCURY	0.11	U	0.11	MG/KG	35	23		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	NICKEL	24.4	J	4.4	MG/KG	2,300	1,500		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	SELENIUM	0.69	UJ	0.69	MG/KG	580	380		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	SILVER	1.6	U	1.6	MG/KG	580	380		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	THALLIUM	0.92	J	0.69	MG/KG	8.2	NIA		
SS-29	D2009	7/26/95	SOIL	METAL	3	3.5	ZINC	200		0.92	MG/KG	35,000	23,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	380	U	380	UG/KG	1,200,000	620,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	380	U	380	UG/KG	11,000,000	2,300,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	380	U	380	UG/KG	10,000,000	2,800,000		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	380	U	380	UG/KG	57,000	7,400		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	950	U	950	UG/KG	12,000,000	6,500,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	380	U	380	UG/KG	120,000	40,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	380	U	380	UG/KG	350,000	200,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	380	U	380	UG/KG	NIA	1,300,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	950	UJ	950	UG/KG	230,000	130,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	380	U	380	UG/KG	2,000	130,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	380	U	380	UG/KG	120,000	65,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	380	U	380	UG/KG	9,400,000	5,200,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	380	U	380	UG/KG	580,000	330,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	380	U	380	UG/KG	580,000	3,300,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2-NITROANILINE	950	U	950	UG/KG	7,000	3,900		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	380	U	380	UG/KG	3,000	990		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	3-NITROANILINE	950	U	950	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	950	U	950	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYLPHENOL	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	380	U	380	UG/KG	470,000	260,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NR		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	380	U	380	UG/KG	580,000	330,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-NITROANILINE	950	U	950	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	950	U	950	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	380	U	380	UG/KG	7,000,000	360,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	380	U	380	UG/KG	7,000,000	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	ANTHRACENE	380	U	380	UG/KG	35,000,000	19,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	380	U	380	UG/KG	1,100	610		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	380	U	380	UG/KG	190	61		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	380	U	380	UG/KG	1,100	610		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	380	U	380	UG/KG	1,100	6,100		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	380	U	380	UG/KG	1,200	74		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	380	U	380	UG/KG	97,000	32,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	380	U	380	UG/KG	2,300,000	13,000,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	CARBAZOLE	380	U	380	UG/KG	NIA	22,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	CHRYSENE	380	U	380	UG/KG	110,000	24,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHALATE	380	U	380	UG/KG	12,000,000	6,500,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	380	U	380	UG/KG	NR	1,300,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	380	U	380	UG/KG	110	61		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	5.7	U	5.7	MG/KG	NR	NR		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DIETHYL PHTHAL	380	U	380	UG/KG	94,000,000	52,000,000		

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SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	380	U	380	UG/KG	NR	100,000,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	FLUORANTHENE	380	U	380	UG/KG	4,700,000	2,600,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	FLUORENE	380	U	380	UG/KG	4,700,000	300,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	380	U	380	UG/KG	850	280		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	380	R	380	UG/KG	17,000	5,700		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	380	U	380	UG/KG	820,000	450,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	HEXACHLOROETHANE	380	U	380	UG/KG	97,000	32,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	380	U	380	UG/KG	1,100	610		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	ISOPHORONE	380	U	380	UG/KG	1,400,000	470,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	380	U	380	UG/KG	190	63		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	380	U	380	UG/KG	280,000	91,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	NAPHTHALENE	380	U	380	UG/KG	4,700,000	800,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	NITROBENZENE	380	U	380	UG/KG	58,000	33,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	950	U	950	UG/KG	11,000	2,500		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	PHENANTHRENE	380	U	380	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	PHENOL	380	U	380	UG/KG	70,000,000	39,000,000		
SS-29	D2009	7/26/95	SOIL	SVOC	3	3.5	PYRENE	380	U	380	UG/KG	3,500,000	2,000,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,1,1-TRICHLOROETHANE	11	U	11	UG/KG	11,000,000	3,200,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,1,2,2-TETRACHLOROETHANE	11	U	11	UG/KG	6,800	900		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,1,2-TRICHLOROETHANE	11	U	11	UG/KG	24,000	1,400		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,1-DICHLOROETHANE	11	U	11	UG/KG	1,200,000	840,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,1-DICHLOROETHENE	11	UJ	11	UG/KG	2,300	38		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROETHANE	11	U	11	UG/KG	15,000	440		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROETHENE (TOTAL)	11	U	11	UG/KG	2,300,000	NIA		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	1,2-DICHLOROPROPANE	11	U	11	UG/KG	20,000	680		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	2-BUTANONE	11	U	11	UG/KG	70,000,000	8,700,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	2-HEXANONE	11	U	11	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	4-METHYL-2-PENTANONE	11	U	11	UG/KG	9,400,000	5,200,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	ACETONE	11	UJ	11	UG/KG	12,000,000	2,000,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	BENZENE	11	U	11	UG/KG	47,000	1,400		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	BROMODICHLOROMETHANE	11	U	11	UG/KG	22,000	1,400		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	BROMOFORM	11	U	11	UG/KG	170,000	56,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	BROMOMETHANE	11	U	11	UG/KG	160,000	15,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CARBON DISULFIDE	11	UJ	11	UG/KG	12,000,000	16,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CARBON TETRACHLORIDE	11	U	11	UG/KG	10,000	470		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CHLOROBENZENE	11	U	11	UG/KG	2,300,000	160,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CHLOROETHANE	11	U	11	UG/KG	NIA	NIA		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CHLOROFORM	11	U	11	UG/KG	220,000	530		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CHLOROMETHANE	11	U	11	UG/KG	100,000	2,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CIS-1,2-DICHLOROETHENE	11	U	11	UG/KG	1,200,000	59,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	CIS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	DIBROMOCHLOROMETHANE	11	U	11	UG/KG	16,000	5,300		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	ETHYL BENZENE	11	U	11	UG/KG	12,000,000	2,900,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	METHYLENE CHLORIDE	11	UJ	11	UG/KG	180,000	11,000		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	STYRENE	11	U	11	UG/KG	2,300,000	2,200,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	TETRACHLOROETHENE	11	U	11	UG/KG	27,000	7,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	TOLUENE	11	U	11	UG/KG	23,000,000	1,900,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	TRANS-1,2-DICHLOROETHENE	11	U	11	UG/KG	2,300,000	170,000		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	TRANS-1,3-DICHLOROPROPENE	11	U	11	UG/KG	7,600	NIA		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	TRICHLOROETHENE	11	U	11	UG/KG	120,000	7,100		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	VINYL CHLORIDE	11	U	11	UG/KG	720	5.2		
SS-29	D2009	7/26/95	SOIL	VOC	3	3.5	XYLENE (TOTAL)	11	U	11	UG/KG	230,000,000	980,000		
GOLF COURSE MAINTENANCE AREA, SS-31															
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	1,2,4-TRICHLOROBENZENE	370	U	370	UG/KG	1,200,000	620,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	1,2-DICHLOROBENZENE	370	U	370	UG/KG	11,000,000	2,300,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	1,3-DICHLOROBENZENE	370	U	370	UG/KG	10,000,000	2,800,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	1,4-DICHLOROBENZENE	370	U	370	UG/KG	57,000	7,400		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,4,5-TRICHLOROPHENOL	940	U	940	UG/KG	12,000,000	6,500,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,4,6-TRICHLOROPHENOL	370	U	370	UG/KG	120,000	40,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,4-DICHLOROPHENOL	370	U	370	UG/KG	350,000	200,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,4-DIMETHYPHENOL	370	U	370	UG/KG	NIA	1,300,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,4-DINITROPHENOL	940	UJ	940	UG/KG	230,000	130,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,4-DINITROTOLUENE	370	U	370	UG/KG	2,000	130,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2,6-DINITROTOLUENE	370	U	370	UG/KG	120,000	65,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2-CHLORONAPHTHALENE	370	U	370	UG/KG	9,400,000	5,200,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2-CHLOROPHENOL	370	U	370	UG/KG	580,000	330,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2-METHYLNAPHTHALENE	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2-METHYLPHENOL	370	U	370	UG/KG	580,000	3,300,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2-NITROANILINE	940	U	940	UG/KG	7,000	3,900		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	2-NITROPHENOL	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	3,3'-DICHLOROBENZIDINE	370	U	370	UG/KG	3,000	990		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	3-NITROANILINE	940	U	940	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4,6-DINITRO-2-METHYLPHENOL	940	U	940	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-BROMOPHENYL-PHENYLETHER	370	U	370	UG/KG	NR	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-CHLORO-3-METHYLPHENOL	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-CHLOROANILINE	370	U	370	UG/KG	470,000	260,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-CHLOROPHENYL-PHENYLETHER	370	U	370	UG/KG	NR	NR		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-METHYLPHENOL	370	U	370	UG/KG	580,000	330,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-NITROANILINE	940	U	940	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	4-NITROPHENOL	940	U	940	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	ACENAPHTHENE	370	U	370	UG/KG	7,000,000	360,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	ACENAPHTHYLENE	370	U	370	UG/KG	7,000,000	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	ANTHRACENE	370	U	370	UG/KG	35,000,000	19,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BENZO(A)ANTHRACENE	370	U	370	UG/KG	1,100	610		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BENZO(A)PYRENE	370	U	370	UG/KG	190	61		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BENZO(B)FLUORANTHENE	370	U	370	UG/KG	1,100	610		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BENZO(G,H,I)PERYLENE	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BENZO(K)FLUORANTHENE	370	U	370	UG/KG	1,100	6,100		

Appendix A
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BIS(2-CHLOROETHOXY)METHANE	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BIS(2-CHLOROETHYL)ETHER	370	U	370	UG/KG	1,200	74		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BIS(2-ETHYLHEXYL)PHTHALATE	370	U	370	UG/KG	97,000	32,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	BUTYL BENZYL PHTHALATE	370	U	370	UG/KG	2,300,000	13,000,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	CARBAZOLE	370	U	370	UG/KG	NIA	22,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	CHRYSENE	370	U	370	UG/KG	110,000	24,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DI-N-BUTYL PHTHALATE	370	U	370	UG/KG	12,000,000	6,500,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DI-N-OCTYL PHTHALATE	370	U	370	UG/KG	NR	1,300,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DIBENZ(A,H)ANTHRACENE	370	U	370	UG/KG	110	61		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DIBENZOFURAN	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DIESEL RANGE ORGANICS	5.6	U	5.6	MG/KG	NR	NR		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DIETHYL PHTHALATE	370	U	370	UG/KG	94,000,000	52,000,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	DIMETHY PHTHALATE	370	U	370	UG/KG	NR	100,000,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	FLUORANTHENE	370	U	370	UG/KG	4,700,000	2,600,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	FLUORENE	370	U	370	UG/KG	4,700,000	300,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROBENZENE	370	U	370	UG/KG	850	280		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROBUTADIENE	370	U	370	UG/KG	17,000	5,700		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROCYCLOPENTADIENE	370	R	370	UG/KG	820,000	450,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROETHANE	370	U	370	UG/KG	97,000	32,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	INDENO(1,2,3-CD)PYRENE	370	U	370	UG/KG	1,100	610		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	ISOPHORONE	370	U	370	UG/KG	1,400,000	470,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	N-NITROSO-DI-N-PROPYLAMINE	370	U	370	UG/KG	190	63		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	N-NITROSODIPHENYLAMINE (1)	370	U	370	UG/KG	280,000	91,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	NAPHTHALENE	370	U	370	UG/KG	4,700,000	800,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	NITROBENZENE	370	U	370	UG/KG	58,000	33,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	PENTACHLOROPHENOL	940	U	940	UG/KG	11,000	2,500		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	PHENANTHRENE	370	U	370	UG/KG	NIA	NIA		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	PHENOL	370	U	370	UG/KG	70,000,000	39,000,000		
SS-31	D2010	7/25/95	SOIL	SVOC	3.5	4	PYRENE	370	U	370	UG/KG	3,500,000	2,000,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	1,2,4-TRICHLOROBENZENE	380	U	380	UG/KG	1,200,000	620,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	1,2-DICHLOROBENZENE	380	U	380	UG/KG	11,000,000	2,300,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	1,3-DICHLOROBENZENE	380	U	380	UG/KG	10,000,000	2,800,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	1,4-DICHLOROBENZENE	380	U	380	UG/KG	57,000	7,400		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,4,5-TRICHLOROPHENOL	950	U	950	UG/KG	12,000,000	6,500,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,4,6-TRICHLOROPHENOL	380	U	380	UG/KG	120,000	40,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,4-DICHLOROPHENOL	380	U	380	UG/KG	350,000	200,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,4-DIMETHYPHENOL	380	U	380	UG/KG	NIA	1,300,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,4-DINITROPHENOL	950	UJ	950	UG/KG	230,000	130,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,4-DINITROTOLUENE	380	U	380	UG/KG	2,000	130,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2,6-DINITROTOLUENE	380	U	380	UG/KG	120,000	65,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2-CHLORONAPHTHALENE	380	U	380	UG/KG	9,400,000	5,200,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2-CHLOROPHENOL	380	U	380	UG/KG	580,000	330,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2-METHYLNAPHTHALENE	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2-METHYLPHENOL	380	U	380	UG/KG	580,000	3,300,000		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2-NITROANILINE	950	U	950	UG/KG	7,000	3,900		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	2-NITROPHENOL	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	3,3'-DICHLOROBENZIDINE	380	U	380	UG/KG	3,000	990		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	3-NITROANILINE	950	U	950	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4,6-DINITRO-2-METHYLPHENOL	950	U	950	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-BROMOPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-CHLORO-3-METHYLPHENOL	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-CHLOROANILINE	380	U	380	UG/KG	470,000	260,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-CHLOROPHENYL-PHENYLETHER	380	U	380	UG/KG	NR	NR		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-METHYLPHENOL	380	U	380	UG/KG	580,000	330,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-NITROANILINE	950	U	950	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	4-NITROPHENOL	950	U	950	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	ACENAPHTHENE	380	U	380	UG/KG	7,000,000	360,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	ACENAPHTHYLENE	380	U	380	UG/KG	7,000,000	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	ANTHRACENE	380	U	380	UG/KG	35,000,000	19,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BENZO(A)ANTHRACENE	380	U	380	UG/KG	1,100	610		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BENZO(A)PYRENE	380	U	380	UG/KG	190	61		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BENZO(B)FLUORANTHENE	380	U	380	UG/KG	1,100	610		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BENZO(G,H,I)PERYLENE	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BENZO(K)FLUORANTHENE	380	U	380	UG/KG	1,100	6,100		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BIS(2-CHLOROETHOXY)METHANE	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BIS(2-CHLOROETHYL)ETHER	380	U	380	UG/KG	1,200	74		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BIS(2-ETHYLHEXYL)PHTHALATE	380	U	380	UG/KG	97,000	32,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	BUTYL BENZYL PHTHALATE	380	U	380	UG/KG	2,300,000	13,000,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	CARBAZOLE	380	U	380	UG/KG	NIA	22,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	CHRYSENE	380	U	380	UG/KG	110,000	24,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DI-N-BUTYL PHTHALATE	380	U	380	UG/KG	12,000,000	6,500,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DI-N-OCTYL PHTHALATE	380	U	380	UG/KG	NR	1,300,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DIBENZ(A,H)ANTHRACENE	380	U	380	UG/KG	110	61		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DIBENZOFURAN	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DIESEL RANGE ORGANICS	5.7	U	5.7	MG/KG	NR	NR		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DIETHYL PHTHALATE	380	U	380	UG/KG	94,000,000	52,000,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	DIMETHY PHTHALATE	380	U	380	UG/KG	NR	100,000,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	FLUORANTHENE	380	U	380	UG/KG	4,700,000	2,600,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	FLUORENE	380	U	380	UG/KG	4,700,000	300,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROBENZENE	380	U	380	UG/KG	850	280		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROBUTADIENE	380	U	380	UG/KG	17,000	5,700		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROCYCLOPENTADIENE	380	R	380	UG/KG	820,000	450,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	HEXACHLOROETHANE	380	U	380	UG/KG	97,000	32,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	INDENO(1,2,3-CD)PYRENE	380	U	380	UG/KG	1,100	610		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	ISOPHORONE	380	U	380	UG/KG	1,400,000	470,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	N-NITROSO-DI-N-PROPYLAMINE	380	U	380	UG/KG	190	63		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	N-NITROSODIPHENYLAMINE (1)	380	U	380	UG/KG	280,000	91,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	NAPHTHALENE	380	U	380	UG/KG	4,700,000	800,000		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	NITROBENZENE	380	U	380	UG/KG	58,000	33,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	PENTACHLOROPHENOL	950	U	950	UG/KG	11,000	2,500		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	PHENANTHRENE	380	U	380	UG/KG	NIA	NIA		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	PHENOL	380	U	380	UG/KG	70,000,000	39,000,000		
SS-31	D2011	7/25/95	SOIL	SVOC	3.5	4	PYRENE	380	U	380	UG/KG	3,500,000	2,000,000		
MUNITIONS INCINERATOR, FACILITY 1119															
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	ANTIMONY	8.2	R	8.2	MG/KG	47	31		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	ARSENIC	5.8		0.63	MG/KG	0.91	0.32		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	BERYLLIUM	0.21	U	0.21	MG/KG	0.32	0.14		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	CADMIUM	1.1	U	1.1	MG/KG	58	38		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	CHROMIUM	22.1		1.7	MG/KG	580	210		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	COPPER	28.5		1.3	MG/KG	4,300	2,800		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	LEAD	16.7		0.42	MG/KG	400	400		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	MERCURY	0.11	U	0.11	MG/KG	35	23		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	NICKEL	18.8		4	MG/KG	2,300	1,500		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	SELENIUM	1.5	J	0.63	MG/KG	580	380		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	SILVER	1.5	U	1.5	MG/KG	580	380		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	THALLIUM	1.5	J	0.63	MG/KG	8.2	NIA		
INCI	D2014	7/20/95	SOIL	METAL	3	3.5	ZINC	84.8		0.84	MG/KG	35,000	23,000		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDD	3.5	U	3.5	UG/KG	5,700	1,900		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDE	3.5	U	3.5	UG/KG	4,000	1,300		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDT	3.5	UJ	3.5	UG/KG	4,000	1,300		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aldrin	1.8	UJ	1.8	UG/KG	80	26		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	alpha-BHC	1.8	U	1.8	UG/KG	220	71		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	alpha-Chlordane	1.8	U	1.8	UG/KG	1,000	340		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1016	35	U	35	UG/KG	8,200	4,900		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1221	71	U	71	UG/KG	180	1,400		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1232	35	U	35	UG/KG	180	1,400		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1242	35	U	35	UG/KG	180	1,400		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1248	35	U	35	UG/KG	180	1,400		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1254	35	U	35	UG/KG	180	1,400		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1260	35	U	35	UG/KG	180	1,400		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	beta-BHC	1.8	U	1.8	UG/KG	760	250		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	delta-BHC	1.8	U	1.8	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Dieldrin	3.5	U	3.5	UG/KG	90	28		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan I	1.8	U	1.8	UG/KG	5,800	NIA		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan II	3.5	U	3.5	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan sulfate	3.5	U	3.5	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Endrin	3.5	U	3.5	UG/KG	35,000	20,000		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Endrin ketone	3.5	U	3.5	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	gamma-BHC (Lindane)	1.8	U	1.8	UG/KG	1,000	340		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	gamma-Chlordane	1.8	U	1.8	UG/KG	1,000	340		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Heptachlor	1.8	U	1.8	UG/KG	300	99		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Heptachlor epoxide	1.8	U	1.8	UG/KG	150	49		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Methoxychlor	18	U	18	UG/KG	580,000	330,000		
INCI	D2014	7/20/95	SOIL	PESTPCB	3	3.5	Toxaphene	180	U	180	UG/KG	1,200	400		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	350	U	350	UG/KG	1,200,000	620,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	350	U	350	UG/KG	11,000,000	2,300,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	350	U	350	UG/KG	10,000,000	2,800,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	350	U	350	UG/KG	57,000	7,400		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	870	U	870	UG/KG	12,000,000	6,500,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	350	U	350	UG/KG	120,000	40,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	350	U	350	UG/KG	350,000	200,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	350	U	350	UG/KG	NIA	1,300,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	870	UJ	870	UG/KG	230,000	130,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	350	U	350	UG/KG	2,000	130,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	350	U	350	UG/KG	120,000	65,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	350	U	350	UG/KG	9,400,000	5,200,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	350	U	350	UG/KG	580,000	330,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	350	U	350	UG/KG	580,000	3,300,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2-NITROANILINE	870	U	870	UG/KG	7,000	3,900		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	350	U	350	UG/KG	3,000	990		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	3-NITROANILINE	870	U	870	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	870	U	870	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	350	U	350	UG/KG	NR	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYLPHENOL	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	350	U	350	UG/KG	470,000	260,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	350	U	350	UG/KG	NR	NR		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	350	U	350	UG/KG	580,000	330,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-NITROANILINE	870	U	870	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	870	U	870	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	350	U	350	UG/KG	7,000,000	360,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	350	U	350	UG/KG	7,000,000	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	ANTHRACENE	350	U	350	UG/KG	35,000,000	19,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	350	U	350	UG/KG	1,100	610		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	350	U	350	UG/KG	190	61		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	350	U	350	UG/KG	1,100	610		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	350	U	350	UG/KG	1,100	6,100		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	350	U	350	UG/KG	1,200	74		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	350	U	350	UG/KG	97,000	32,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	350	U	350	UG/KG	2,300,000	13,000,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	CARBAZOLE	350	U	350	UG/KG	NIA	22,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	CHRYSENE	350	U	350	UG/KG	110,000	24,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHA	350	U	350	UG/KG	12,000,000	6,500,000		

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	350	U	350	UG/KG	NR	1,300,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	350	U	350	UG/KG	110	61		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	5.3	U	5.3	MG/KG	NR	NR		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DIETHYL PHTHALATE	350	U	350	UG/KG	94,000,000	52,000,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	350	U	350	UG/KG	NR	100,000,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	FLUORANTHENE	350	U	350	UG/KG	4,700,000	2,600,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	FLUORENE	350	U	350	UG/KG	4,700,000	300,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	350	U	350	UG/KG	850	280		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	350	U	350	UG/KG	17,000	5,700		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	350	R	350	UG/KG	820,000	450,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROETHANE	350	U	350	UG/KG	97,000	32,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	350	U	350	UG/KG	1,100	610		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	ISOPHORONE	350	U	350	UG/KG	1,400,000	470,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	350	U	350	UG/KG	190	63		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	350	U	350	UG/KG	280,000	91,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	NAPHTHALENE	350	U	350	UG/KG	4,700,000	800,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	NITROBENZENE	350	U	350	UG/KG	58,000	33,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	870	U	870	UG/KG	11,000	2,500		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	PHENANTHRENE	350	U	350	UG/KG	NIA	NIA		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	PHENOL	350	U	350	UG/KG	70,000,000	39,000,000		
INCI	D2014	7/20/95	SOIL	SVOC	3	3.5	PYRENE	350	U	350	UG/KG	3,500,000	2,000,000		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	ANTIMONY	8.3	R	8.3	MG/KG	47	31		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	ARSENIC	5.3		0.64	MG/KG	0.91	0.32		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	BERYLLIUM	0.65	J	0.21	MG/KG	0.32	0.14		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	CADMIUM	1.1	U	1.1	MG/KG	58	38		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	CHROMIUM	23.9		1.7	MG/KG	580	210		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	COPPER	32.4		1.3	MG/KG	4,300	2,800		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	LEAD	16.6		0.43	MG/KG	400	400		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	MERCURY	0.11	U	0.11	MG/KG	35	23		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	NICKEL	21.5	J	4	MG/KG	2,300	1,500		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	SELENIUM	0.86	J	0.64	MG/KG	580	380		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	SILVER	1.5	U	1.5	MG/KG	580	380		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	THALLIUM	0.99	J	0.64	MG/KG	8.2	NIA		
INCI	D2015	7/20/95	SOIL	METAL	3	3.5	ZINC	78.8		0.85	MG/KG	35,000	23,000		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDD	3.5	U	3.5	UG/KG	5,700	1,900		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDE	3.5	U	3.5	UG/KG	4,000	1,300		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDT	3.5	UJ	3.5	UG/KG	4,000	1,300		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aldrin	1.8	UJ	1.8	UG/KG	80	26		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	alpha-BHC	1.8	U	1.8	UG/KG	220	71		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	alpha-Chlordane	1.8	U	1.8	UG/KG	1,000	340		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1016	35	U	35	UG/KG	8,200	4,900		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1221	71	U	71	UG/KG	180	1,400		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1232	35	U	35	UG/KG	180	1,400		

Appendix A
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1242	35	U	35	UG/KG	180	1,400		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1248	35	U	35	UG/KG	180	1,400		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1254	35	U	35	UG/KG	180	1,400		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1260	35	U	35	UG/KG	180	1,400		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	beta-BHC	1.8	U	1.8	UG/KG	760	250		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	delta-BHC	1.8	U	1.8	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Dieldrin	3.5	U	3.5	UG/KG	90	28		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan I	1.8	U	1.8	UG/KG	5,800	NIA		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan II	3.5	U	3.5	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan sulfate	3.5	U	3.5	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Endrin	3.5	U	3.5	UG/KG	35,000	20,000		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Endrin ketone	3.5	U	3.5	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	gamma-BHC (Lindane)	1.8	U	1.8	UG/KG	1,000	340		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	gamma-Chlordane	1.8	U	1.8	UG/KG	1,000	340		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Heptachlor	1.8	U	1.8	UG/KG	300	99		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Heptachlor epoxide	1.8	U	1.8	UG/KG	150	49		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Methoxychlor	18	U	18	UG/KG	580,000	330,000		
INCI	D2015	7/20/95	SOIL	PESTPCB	3	3.5	Toxaphene	180	U	180	UG/KG	1,200	400		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	350	U	350	UG/KG	1,200,000	620,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	350	U	350	UG/KG	11,000,000	2,300,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	350	U	350	UG/KG	10,000,000	2,800,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	350	U	350	UG/KG	57,000	7,400		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	880	U	880	UG/KG	12,000,000	6,500,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	350	U	350	UG/KG	120,000	40,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	350	U	350	UG/KG	350,000	200,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	350	U	350	UG/KG	NIA	1,300,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	880	UJ	880	UG/KG	230,000	130,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	350	U	350	UG/KG	2,000	130,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	350	U	350	UG/KG	120,000	65,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	350	U	350	UG/KG	9,400,000	5,200,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	350	U	350	UG/KG	580,000	330,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	350	U	350	UG/KG	580,000	3,300,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2-NITROANILINE	880	U	880	UG/KG	7,000	3,900		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	350	U	350	UG/KG	3,000	990		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	3-NITROANILINE	880	U	880	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	880	U	880	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	350	U	350	UG/KG	NR	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYLPHENOL	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	350	U	350	UG/KG	470,000	260,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	350	U	350	UG/KG	NR	NR		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	350	U	350	UG/KG	580,000	330,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-NITROANILIN	880	U	880	UG/KG	NIA	NIA		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	880	U	880	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	350	U	350	UG/KG	7,000,000	360,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	350	U	350	UG/KG	7,000,000	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	ANTHRACENE	350	U	350	UG/KG	35,000,000	19,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	350	U	350	UG/KG	1,100	610		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	350	U	350	UG/KG	190	61		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	350	U	350	UG/KG	1,100	610		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	350	U	350	UG/KG	1,100	6,100		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	350	U	350	UG/KG	1,200	74		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	350	U	350	UG/KG	97,000	32,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	350	U	350	UG/KG	2,300,000	13,000,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	CARBAZOLE	350	U	350	UG/KG	NIA	22,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	CHRYSENE	350	U	350	UG/KG	110,000	24,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHALATE	350	U	350	UG/KG	12,000,000	6,500,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	350	U	350	UG/KG	NR	1,300,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	350	U	350	UG/KG	110	61		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DIESEL RANGE ORGANICS	5.3	U	5.3	MG/KG	NR	NR		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DIETHYL PHTHALATE	350	U	350	UG/KG	94,000,000	52,000,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	350	U	350	UG/KG	NR	100,000,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	FLUORANTHENE	350	U	350	UG/KG	4,700,000	2,600,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	FLUORENE	350	U	350	UG/KG	4,700,000	300,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	350	U	350	UG/KG	850	280		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	350	U	350	UG/KG	17,000	5,700		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	350	R	350	UG/KG	820,000	450,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROETHANE	350	U	350	UG/KG	97,000	32,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	350	U	350	UG/KG	1,100	610		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	ISOPHORONE	350	U	350	UG/KG	1,400,000	470,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	350	U	350	UG/KG	190	63		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	350	U	350	UG/KG	280,000	91,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	NAPHTHALENE	350	U	350	UG/KG	4,700,000	800,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	NITROBENZENE	350	U	350	UG/KG	58,000	33,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	880	U	880	UG/KG	11,000	2,500		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	PHENANTHRENE	350	U	350	UG/KG	NIA	NIA		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	PHENOL	350	U	350	UG/KG	70,000,000	39,000,000		
INCI	D2015	7/20/95	SOIL	SVOC	3	3.5	PYRENE	350	U	350	UG/KG	3,500,000	2,000,000		
CONCRETE HARDFILL AREA, LF-26															
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDD	3.5	U	3.5	UG/KG	5,700	1,900		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDE	1.1	J	3.5	UG/KG	4,000	1,300		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	4,4'-DDT	3.5	UJ	3.5	UG/KG	4,000	1,300		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aldrin	1.8	UJ	1.8	UG/KG	80	26		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	alpha-BHC	1.8	U	1.8	UG/KG	220	71		

Appendix A
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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	alpha-Chlordane	1.8	U	1.8	UG/KG	1,000	340		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1016	35	U	35	UG/KG	8,200	4,900		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1221	72	U	72	UG/KG	180	1,400		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1232	35	U	35	UG/KG	180	1,400		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1242	35	U	35	UG/KG	180	1,400		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1248	35	U	35	UG/KG	180	1,400		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1254	35	U	35	UG/KG	180	1,400		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Aroclor-1260	35	U	35	UG/KG	180	1,400		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	beta-BHC	1.8	U	1.8	UG/KG	760	250		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	delta-BHC	1.8	U	1.8	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Dieldrin	12		3.5	UG/KG	90	28		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan I	1.8	U	1.8	UG/KG	5,800	NIA		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan II	3.5	U	3.5	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Endosulfan sulfate	3.5	U	3.5	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Endrin	3.5	U	3.5	UG/KG	35,000	20,000		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Endrin ketone	3.5	U	3.5	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	gamma-BHC (Lindane)	1.8	U	1.8	UG/KG	1,000	340		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	gamma-Chlordane	1.8	U	1.8	UG/KG	1,000	340		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Heptachlor	1.8	U	1.8	UG/KG	300	99		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Heptachlor epoxide	1.8	U	1.8	UG/KG	150	49		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Methoxychlor	18	U	18	UG/KG	580,000	330,000		
LF-26	D2016	7/20/95	SOIL	PESTPCB	3	3.5	Toxaphene	180	U	180	UG/KG	1,200	400		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	1,2,4-TRICHLOROBENZENE	360	U	360	UG/KG	1,200,000	620,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	1,2-DICHLOROBENZENE	360	U	360	UG/KG	11,000,000	2,300,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	1,3-DICHLOROBENZENE	360	U	360	UG/KG	10,000,000	2,800,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	1,4-DICHLOROBENZENE	360	U	360	UG/KG	57,000	7,400		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,4,5-TRICHLOROPHENOL	900	U	900	UG/KG	12,000,000	6,500,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,4,6-TRICHLOROPHENOL	360	U	360	UG/KG	120,000	40,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,4-DICHLOROPHENOL	360	U	360	UG/KG	350,000	200,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,4-DIMETHYPHENOL	360	U	360	UG/KG	NIA	1,300,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,4-DINITROPHENOL	900	UJ	900	UG/KG	230,000	130,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,4-DINITROTOLUENE	360	U	360	UG/KG	2,000	130,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2,6-DINITROTOLUENE	360	U	360	UG/KG	120,000	65,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2-CHLORONAPHTHALENE	360	U	360	UG/KG	9,400,000	5,200,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2-CHLOROPHENOL	360	U	360	UG/KG	580,000	330,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2-METHYLNAPHTHALENE	360	U	360	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2-METHYLPHENOL	360	U	360	UG/KG	580,000	3,300,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2-NITROANILINE	900	U	900	UG/KG	7,000	3,900		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	2-NITROPHENOL	360	U	360	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	3,3'-DICHLOROBENZIDINE	360	U	360	UG/KG	3,000	990		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	3-NITROANILINE	900	U	900	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4,6-DINITRO-2-METHYLPHENOL	900	U	900	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-BROMOPHENYL-PHENYLETHER	360	U	360	UG/KG	NR	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-CHLORO-3-METHYL[redacted]OL	360	U	360	UG/KG	NIA	NIA		

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Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-CHLOROANILINE	360	U	360	UG/KG	470,000	260,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-CHLOROPHENYL-PHENYLETHER	360	U	360	UG/KG	NR	NR		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-METHYLPHENOL	360	U	360	UG/KG	580,000	330,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-NITROANILINE	900	U	900	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	4-NITROPHENOL	900	U	900	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	ACENAPHTHENE	360	U	360	UG/KG	7,000,000	360,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	ACENAPHTHYLENE	360	U	360	UG/KG	7,000,000	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	ANTHRACENE	360	U	360	UG/KG	35,000,000	19,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BENZO(A)ANTHRACENE	360	U	360	UG/KG	1,100	610		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BENZO(A)PYRENE	360	U	360	UG/KG	190	61		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BENZO(B)FLUORANTHENE	360	U	360	UG/KG	1,100	610		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BENZO(G,H,I)PERYLENE	360	U	360	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BENZO(K)FLUORANTHENE	360	U	360	UG/KG	1,100	6,100		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHOXY)METHANE	360	U	360	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BIS(2-CHLOROETHYL)ETHER	360	U	360	UG/KG	1,200	74		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BIS(2-ETHYLHEXYL)PHTHALATE	360	U	360	UG/KG	97,000	32,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	BUTYL BENZYL PHTHALATE	360	U	360	UG/KG	2,300,000	13,000,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	CARBAZOLE	360	U	360	UG/KG	NIA	22,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	CHRYSENE	360	U	360	UG/KG	110,000	24,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	DI-N-BUTYL PHTHALATE	360	U	360	UG/KG	12,000,000	6,500,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	DI-N-OCTYL PHTHALATE	360	U	360	UG/KG	NR	1,300,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	DIBENZ(A,H)ANTHRACENE	360	U	360	UG/KG	110	61		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	DIBENZOFURAN	360	U	360	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	DIETHYL PHTHALATE	360	U	360	UG/KG	94,000,000	52,000,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	DIMETHY PHTHALATE	360	U	360	UG/KG	NR	100,000,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	FLUORANTHENE	360	U	360	UG/KG	4,700,000	2,600,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	FLUORENE	360	U	360	UG/KG	4,700,000	300,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROBENZENE	360	U	360	UG/KG	850	280		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROBUTADIENE	360	U	360	UG/KG	17,000	5,700		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROCYCLOPENTADIENE	360	R	360	UG/KG	820,000	450,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	HEXACHLOROETHANE	360	U	360	UG/KG	97,000	32,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	INDENO(1,2,3-CD)PYRENE	360	U	360	UG/KG	1,100	610		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	ISOPHORONE	360	U	360	UG/KG	1,400,000	470,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	N-NITROSO-DI-N-PROPYLAMINE	360	U	360	UG/KG	190	63		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	N-NITROSODIPHENYLAMINE (1)	360	U	360	UG/KG	280,000	91,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	NAPHTHALENE	360	U	360	UG/KG	4,700,000	800,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	NITROBENZENE	360	U	360	UG/KG	58,000	33,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	PENTACHLOROPHENOL	900	U	900	UG/KG	11,000	2,500		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	PHENANTHRENE	360	U	360	UG/KG	NIA	NIA		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	PHENOL	360	U	360	UG/KG	70,000,000	39,000,000		
LF-26	D2016	7/20/95	SOIL	SVOC	3	3.5	PYRENE	360	U	360	UG/KG	3,500,000	2,000,000		
AIRFIELD USTs, ST-25															
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	1,2,4-TRICHLOROBENZENE	10	U	10	UG/L			70	190
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	1,2-DICHLOROBENZENE	10	U	10	UG/L			630	370

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Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	1,3-DICHLOROBENZENE	10	U	10	UG/L			620	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	1,4-DICHLOROBENZENE	10	U	10	UG/L			1.5	0.47
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,4,5-TRICHLOROPHENOL	25	U	25	UG/L			700	3700
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,4,6-TRICHLOROPHENOL	10	U	10	UG/L			3.2	6.1
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,4-DICHLOROPHENOL	10	U	10	UG/L			21	110
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,4-DIMETHYPHENOL	10	U	10	UG/L			NIA	730
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,4-DINITROPHENOL	25	U	25	UG/L			14	73
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,4-DINITROTOLUENE	10	U	10	UG/L			0.05	73
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2,6-DINITROTOLUENE	10	U	10	UG/L			NIA	37
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2-CHLORONAPHTHALENE	10	U	10	UG/L			NIA	2900
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2-CHLOROPHENOL	10	U	10	UG/L			35	180
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2-METHYLNAPHTHALENE	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2-METHYLPHENOL	10	U	10	UG/L			NIA	1800
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2-NITROANILINE	25	U	25	UG/L			NIA	2.2
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	2-NITROPHENOL	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	3,3'-DICHLOROBENZIDINE	10	U	10	UG/L			0.08	0.15
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	3-NITROANILINE	25	U	25	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4,6-DINITRO-2-METHYLPHENOL	25	U	25	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-BROMOPHENYL-PHENYLETHER	10	U	10	UG/L			NR	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-CHLORO-3-METHYLPHENOL	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-CHLOROANILINE	10	U	10	UG/L			NIA	150
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-CHLOROPHENYL-PHENYLETHER	10	U	10	UG/L			NR	NR
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-METHYLPHENOL	10	U	10	UG/L			NIA	180
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-NITROANILINE	25	U	25	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	4-NITROPHENOL	25	U	25	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	ACENAPHTHENE	10	U	10	UG/L			420	370
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	ACENAPHTHYLENE	10	U	10	UG/L			420	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	ANTHRACENE	10	U	10	UG/L			2100	1800
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BENZO(A)ANTHRACENE	10	U	10	UG/L			0.03	0.092
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BENZO(A)PYRENE	10	U	10	UG/L			0.005	0.0092
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BENZO(B)FLUORANTHENE	10	U	10	UG/L			0.03	0.092
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BENZO(G,H,I)PERYLENE	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BENZO(K)FLUORANTHENE	10	U	10	UG/L			0.03	0.92
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BIS(2-CHLOROETHOXY)METHANE	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BIS(2-CHLOROETHYL)ETHER	10	U	10	UG/L			0.03	0.0098
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BIS(2-ETHYLHEXYL)PHTHALATE	10	U	10	UG/L			2.5	4.8
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	BUTYL BENZYL PHTHALATE	10	U	10	UG/L			140	7300
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	CARBAZOLE	10	U	10	UG/L			NIA	3.4
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	CHRYSENE	10	U	10	UG/L			2.8	9.2
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	DI-N-BUTYL PHTHALATE	10	U	10	UG/L			700	3700
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	DI-N-OCTYL PHTHALATE	10	U	10	UG/L			NR	730
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	DIBENZ(A,H)ANTHRACENE	10	U	10	UG/L			0.003	0.0092
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	DIBENZOFURAN	10	U	10	UG/L			NIA	NIA
Meth. Blan[redacted]	Q3001	7/24/95	WATER	SVOC	0	0	DIETHYL PHTHAL[redacted]	10	U	10	UG/L			560[redacted]	29000

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	DIMETHY PHTHALATE	10	U	10	UG/L			NR	370000
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	FLUORANTHENE	10	U	10	UG/L			280	1500
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	FLUORENE	10	U	10	UG/L			280	240
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	HEXACHLOROBENZENE	10	U	10	UG/L			0.02	0.042
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	HEXACHLOROBUTADIENE	10	U	10	UG/L			0.45	0.86
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	HEXACHLOROCYCLOPENTADIENE	10	U	10	UG/L			49	260
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	HEXACHLOROETHANE	10	U	10	UG/L			2.5	4.8
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	INDENO(1,2,3-CD)PYRENE	10	U	10	UG/L			0.03	0.092
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	ISOPHORONE	10	U	10	UG/L			37	71
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	N-NITROSO-DI-N-PROPYLAMINE	10	U	10	UG/L			0.005	0.0096
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	N-NITROSODIPHENYLAMINE (1)	10	U	10	UG/L			7.1	14
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	NAPHTHALENE	10	U	10	UG/L			280	240
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	NITROBENZENE	10	U	10	UG/L			3.5	18
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	PENTACHLOROPHENOL	25	U	25	UG/L			0.29	0.56
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	PHENANTHRENE	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	PHENOL	10	U	10	UG/L			4200	22000
Meth. Blank	Q3001	7/24/95	WATER	SVOC	0	0	PYRENE	10	U	10	UG/L			210	1100
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,1,1-TRICHLOROETHANE	10	U	10	UG/L			630	1300
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,1,2,2-TETRACHLOROETHANE	10	U	10	UG/L			0.18	0.055
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,1,2-TRICHLOROETHANE	10	U	10	UG/L			0.61	0.2
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,1-DICHLOROETHANE	10	U	10	UG/L			NIA	810
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,1-DICHLOROETHENE	10	U	10	UG/L			0.06	0.046
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,2-DICHLOROETHANE	10	U	10	UG/L			0.38	0.12
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,2-DICHLOROETHENE (TOTAL)	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	1,2-DICHLOROPROPANE	10	U	10	UG/L			0.51	0.16
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	2-BUTANONE	10	U	10	UG/L			4200	1900
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	2-HEXANONE	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	4-METHYL-2-PENTANONE	10	U	10	UG/L			NIA	2900
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	ACETONE	6	JB	10	UG/L			700	610
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	BENZENE	10	U	10	UG/L			1.2	0.39
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	BROMODICHLOROMETHANE	10	U	10	UG/L			0.56	0.18
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	BROMOFORM	10	U	10	UG/L			4.4	8.5
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	BROMOMETHANE	10	U	10	UG/L			9.8	8.7
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CARBON DISULFIDE	10	U	10	UG/L			700	21
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CARBON TETRACHLORIDE	10	U	10	UG/L			0.27	0.17
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CHLOROBENZENE	10	U	10	UG/L			140	39
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CHLOROETHANE	10	U	10	UG/L			NIA	NIA
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CHLOROFORM	10	U	10	UG/L			5.7	0.16
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CHLOROMETHANE	10	U	10	UG/L			2.7	1.5
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CIS-1,2-DICHLOROETHENE	10	U	10	UG/L			70	61
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	CIS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	DIBROMOCHLOROMETHANE	10	U	10	UG/L			0.42	1
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	ETHYL BENZENE	10	U	10	UG/L			700	1300
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	METHYLENE CHLORIDE	10	U	10	UG/L			4.7	4.3

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	STYRENE	10	U	10	UG/L			140	1600
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	TETRACHLOROETHENE	10	U	10	UG/L			0.7	1.1
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	TOLUENE	10	U	10	UG/L			1400	720
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	TRANS-1,2-DICHLOROETHENE	10	U	10	UG/L			140	120
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	TRANS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	TRICHLOROETHENE	10	U	10	UG/L			3.2	1.6
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	VINYL CHLORIDE	10	U	10	UG/L			0.02	0.02
Meth. Blank	Q3001	7/24/95	WATER	VOC	0	0	XYLENE (TOTAL)	10	U	10	UG/L			14000	1400
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	1,2,4-TRICHLOROBENZENE	10	U	10	UG/L			70	190
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	1,2-DICHLOROBENZENE	10	U	10	UG/L			630	370
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	1,3-DICHLOROBENZENE	10	U	10	UG/L			620	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	1,4-DICHLOROBENZENE	10	U	10	UG/L			1.5	0.47
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,4,5-TRICHLOROPHENOL	26	U	26	UG/L			700	3700
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,4,6-TRICHLOROPHENOL	10	U	10	UG/L			3.2	6.1
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,4-DICHLOROPHENOL	10	U	10	UG/L			21	110
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,4-DIMETHYPHENOL	10	U	10	UG/L			NIA	730
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,4-DINITROPHENOL	26	U	26	UG/L			14	73
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,4-DINITROTOLUENE	10	U	10	UG/L			0.05	73
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2,6-DINITROTOLUENE	10	U	10	UG/L			NIA	37
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2-CHLORONAPHTHALENE	10	U	10	UG/L			NIA	2900
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2-CHLOROPHENOL	10	U	10	UG/L			35	180
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2-METHYLNAPHTHALENE	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2-METHYLPHENOL	10	U	10	UG/L			NIA	1800
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2-NITROANILINE	26	U	26	UG/L			NIA	2.2
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	2-NITROPHENOL	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	3,3'-DICHLOROBENZIDINE	10	U	10	UG/L			0.08	0.15
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	3-NITROANILINE	26	U	26	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4,6-DINITRO-2-METHYLPHENOL	26	U	26	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-BROMOPHENYL-PHENYLETHER	10	U	10	UG/L			NR	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-CHLORO-3-METHYLPHENOL	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-CHLOROANILINE	10	U	10	UG/L			NIA	150
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-CHLOROPHENYL-PHENYLETHER	10	U	10	UG/L			NR	NR
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-METHYLPHENOL	10	U	10	UG/L			NIA	180
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-NITROANILINE	26	U	26	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	4-NITROPHENOL	26	U	26	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	ACENAPHTHENE	10	U	10	UG/L			420	370
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	ACENAPHTHYLENE	10	U	10	UG/L			420	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	ANTHRACENE	10	U	10	UG/L			2100	1800
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BENZO(A)ANTHRACENE	10	U	10	UG/L			0.03	0.092
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BENZO(A)PYRENE	10	U	10	UG/L			0.005	0.0092
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BENZO(B)FLUORANTHENE	10	U	10	UG/L			0.03	0.092
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BENZO(G,H,I)PERYLENE	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BENZO(K)FLUORANTHENE	10	U	10	UG/L			0.03	0.92
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BIS(2-CHLOROETHOXY)METHANE	10	U	10	UG/L			NIA	NIA

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BIS(2-CHLOROETHYL)ETHER	10	U	10	UG/L			0.03	0.0098
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BIS(2-ETHYLHEXYL)PHTHALATE	10	U	10	UG/L			2.5	4.8
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	BUTYL BENZYL PHTHALATE	10	U	10	UG/L			140	7300
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	CARBAZOLE	10	U	10	UG/L			NIA	3.4
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	CHRYSENE	10	U	10	UG/L			2.8	9.2
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	DI-N-BUTYL PHTHALATE	10	U	10	UG/L			700	3700
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	DI-N-OCTYL PHTHALATE	10	U	10	UG/L			NR	730
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	DIBENZ(A,H)ANTHRACENE	10	U	10	UG/L			0.003	0.0092
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	DIBENZOFURAN	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	DIETHYL PHTHALATE	10	U	10	UG/L			5600	29000
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	DIMETHY PHTHALATE	10	U	10	UG/L			NR	370000
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	FLUORANTHENE	10	U	10	UG/L			280	1500
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	FLUORENE	10	U	10	UG/L			280	240
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	HEXACHLOROBENZENE	10	U	10	UG/L			0.02	0.042
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	HEXACHLOROBUTADIENE	10	U	10	UG/L			0.45	0.86
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	HEXACHLOROCYCLOPENTADIENE	10	U	10	UG/L			49	260
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	HEXACHLOROETHANE	10	U	10	UG/L			2.5	4.8
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	INDENO(1,2,3-CD)PYRENE	10	U	10	UG/L			0.03	0.092
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	ISOPHORONE	10	U	10	UG/L			37	71
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	N-NITROSO-DI-N-PROPYLAMINE	10	U	10	UG/L			0.005	0.0096
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	N-NITROSODIPHENYLAMINE (1)	10	U	10	UG/L			7.1	14
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	NAPHTHALENE	10	U	10	UG/L			280	240
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	NITROBENZENE	10	U	10	UG/L			3.5	18
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	PENTACHLOROPHENOL	26	U	26	UG/L			0.29	0.56
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	PHENANTHRENE	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	PHENOL	10	U	10	UG/L			4200	22000
Eqp. Blank	Q3002	7/24/95	WATER	SVOC	0	0	PYRENE	10	U	10	UG/L			210	1100
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,1,1-TRICHLOROETHANE	10	U	10	UG/L			630	1300
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,1,2,2-TETRACHLOROETHANE	10	U	10	UG/L			0.18	0.055
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,1,2-TRICHLOROETHANE	10	U	10	UG/L			0.61	0.2
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,1-DICHLOROETHANE	10	U	10	UG/L			NIA	810
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,1-DICHLOROETHENE	10	U	10	UG/L			0.06	0.046
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,2-DICHLOROETHANE	10	U	10	UG/L			0.38	0.12
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,2-DICHLOROETHENE (TOTAL)	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	1,2-DICHLOROPROPANE	10	U	10	UG/L			0.51	0.16
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	2-BUTANONE	10	U	10	UG/L			4200	1900
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	2-HEXANONE	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	4-METHYL-2-PENTANONE	10	U	10	UG/L			NIA	2900
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	ACETONE	6	JB	10	UG/L			700	610
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	BENZENE	10	U	10	UG/L			1.2	0.39
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	BROMODICHLOROMETHANE	10	U	10	UG/L			0.56	0.18
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	BROMOFORM	10	U	10	UG/L			4.4	8.5
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	BROMOMETHANE	10	U	10	UG/L			9.8	8.7
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CARBON DISULFIDE	10	U	10	UG/L			700	21

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CARBON TETRACHLORIDE	10	U	10	UG/L			0.27	0.17
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CHLOROBENZENE	10	U	10	UG/L			140	39
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CHLOROETHANE	10	U	10	UG/L			NIA	NIA
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CHLOROFORM	10	U	10	UG/L			5.7	0.16
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CHLOROMETHANE	10	U	10	UG/L			2.7	1.5
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CIS-1,2-DICHLOROETHENE	10	U	10	UG/L			70	61
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	CIS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	DIBROMOCHLOROMETHANE	10	U	10	UG/L			0.42	1
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	ETHYL BENZENE	10	U	10	UG/L			700	1300
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	METHYLENE CHLORIDE	10	U	10	UG/L			4.7	4.3
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	STYRENE	10	U	10	UG/L			140	1600
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	TETRACHLOROETHENE	10	U	10	UG/L			0.7	1.1
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	TOLUENE	10	U	10	UG/L			1400	720
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	TRANS-1,2-DICHLOROETHENE	10	U	10	UG/L			140	120
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	TRANS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	TRICHLOROETHENE	10	U	10	UG/L			3.2	1.6
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	VINYL CHLORIDE	10	U	10	UG/L			0.02	0.02
Eqp. Blank	Q3002	7/24/95	WATER	VOC	0	0	XYLENE (TOTAL)	10	U	10	UG/L			14000	1400
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,1,1-TRICHLOROETHANE	10	U	10	UG/L			630	1300
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,1,2,2-TETRACHLOROETHANE	10	U	10	UG/L			0.18	0.055
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,1,2-TRICHLOROETHANE	10	U	10	UG/L			0.61	0.2
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,1-DICHLOROETHANE	10	U	10	UG/L			NIA	810
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,1-DICHLOROETHENE	10	U	10	UG/L			0.06	0.046
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,2-DICHLOROETHANE	10	U	10	UG/L			0.38	0.12
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,2-DICHLOROETHENE (TOTAL)	10	U	10	UG/L			NIA	NIA
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	1,2-DICHLOROPROPANE	10	U	10	UG/L			0.51	0.16
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	2-BUTANONE	10	U	10	UG/L			4200	1900
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	2-HEXANONE	10	U	10	UG/L			NIA	NIA
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	4-METHYL-2-PENTANONE	10	U	10	UG/L			NIA	2900
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	ACETONE	2	JB	10	UG/L			700	610
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	BENZENE	10	U	10	UG/L			1.2	0.39
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	BROMODICHLOROMETHANE	10	U	10	UG/L			0.56	0.18
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	BROMOFORM	10	U	10	UG/L			4.4	8.5
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	BROMOMETHANE	10	U	10	UG/L			9.8	8.7
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CARBON DISULFIDE	10	U	10	UG/L			700	21
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CARBON TETRACHLORIDE	10	U	10	UG/L			0.27	0.17
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CHLOROBENZENE	10	U	10	UG/L			140	39
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CHLOROETHANE	10	U	10	UG/L			NIA	NIA
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CHLOROFORM	10	U	10	UG/L			5.7	0.16
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CHLOROMETHANE	10	U	10	UG/L			2.7	1.5
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CIS-1,2-DICHLOROETHENE	10	U	10	UG/L			70	61
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	CIS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	DIBROMOCHLOROMETHANE	10	U	10	UG/L			0.42	1
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	ETHYL BENZEN	10	U	10	UG/L			70	1300

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	METHYLENE CHLORIDE	10	U	10	UG/L			4.7	4.3
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	STYRENE	10	U	10	UG/L			140	1600
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	TETRACHLOROETHENE	10	U	10	UG/L			0.7	1.1
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	TOLUENE	10	U	10	UG/L			1400	720
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	TRANS-1,2-DICHLOROETHENE	10	U	10	UG/L			140	120
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	TRANS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	TRICHLOROETHENE	10	U	10	UG/L			3.2	1.6
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	VINYL CHLORIDE	10	U	10	UG/L			0.02	0.02
Trip Blank	Q3003	7/24/95	WATER	VOC	0	0	XYLENE (TOTAL)	10	U	10	UG/L			14000	1400
PAINT SHOP LEACH FIELD, WP-27															
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	ANTIMONY	39	U	39	UG/L			2.8	15
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	ARSENIC	3	U	3	UG/L			0.02	0.038
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	BERYLLIUM	1	U	1	UG/L			0.008	0.016
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	CADMIUM	5	U	5	UG/L			3.5	18
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	CHROMIUM	8	U	8	UG/L			100	180
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	COPPER	6	U	6	UG/L			260	1400
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	LEAD	2	U	2	UG/L			5	4
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	MERCURY	0.2	U	0.2	UG/L			2.1	11
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	NICKEL	19	U	19	UG/L			140	730
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	SELENIUM	3	U	3	UG/L			35	180
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	SILVER	7	U	7	UG/L			35	180
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	THALLIUM	3	U	3	UG/L			0.49	NIA
Meth. Blank	Q3004	7/21/95	WATER	METAL	0	0	ZINC	9	B	4	UG/L			2100	11000
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	ANTIMONY	39	U	39	UG/L			2.8	15
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	ARSENIC	3	U	3	UG/L			0.02	0.038
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	BERYLLIUM	1	U	1	UG/L			0.008	0.016
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	CADMIUM	5	U	5	UG/L			3.5	18
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	CHROMIUM	8	U	8	UG/L			100	180
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	COPPER	6	U	6	UG/L			260	1400
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	LEAD	2	U	2	UG/L			5	4
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	MERCURY	0.2	U	0.2	UG/L			2.1	11
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	NICKEL	19	U	19	UG/L			140	730
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	SELENIUM	3	U	3	UG/L			35	180
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	SILVER	7	U	7	UG/L			35	180
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	THALLIUM	3	U	3	UG/L			0.49	NIA
Eqp. Blank	Q3005	7/21/95	WATER	METAL	0	0	ZINC	80		4	UG/L			2100	11000
PRIME BEEF YARD, SS-29															
Method Blank	Q3006	7/26/95	WATER	SVOC	0	0	DIESEL RANGE ORGANICS	0.1	U	0.1	MG/L			NR	NR
Eqp. Blank	Q3007	7/26/95	WATER	SVOC	0	0	DIESEL RANGE ORGANICS	0.1	U	0.1	MG/L			NR	NR
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,1,1-TRICHLOROETHANE	10	U	10	UG/L			630	1300
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,1,2,2-TETRACHLOROETHANE	10	U	10	UG/L			0.18	0.055
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,1,2-TRICHLOROETHANE	10	U	10	UG/L			0.61	0.2
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,1-DICHLOROETHANE	10	U	10	UG/L			NIA	810
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,1-DICHLOROETHENE	10	U	10	UG/L			0.06	0.046

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,2-DICHLOROETHANE	10	U	10	UG/L			0.38	0.12
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,2-DICHLOROETHENE (TOTAL)	10	U	10	UG/L			NIA	NIA
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	1,2-DICHLOROPROPANE	10	U	10	UG/L			0.51	0.16
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	2-BUTANONE	10	U	10	UG/L			4200	1900
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	2-HEXANONE	10	U	10	UG/L			NIA	NIA
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	4-METHYL-2-PENTANONE	10	U	10	UG/L			NIA	2900
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	ACETONE	10	U	10	UG/L			700	610
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	BENZENE	10	U	10	UG/L			1.2	0.39
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	BROMODICHLOROMETHANE	10	U	10	UG/L			0.56	0.18
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	BROMOFORM	10	U	10	UG/L			4.4	8.5
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	BROMOMETHANE	10	U	10	UG/L			9.8	8.7
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CARBON DISULFIDE	10	U	10	UG/L			700	21
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CARBON TETRACHLORIDE	10	U	10	UG/L			0.27	0.17
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CHLOROBENZENE	10	U	10	UG/L			140	39
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CHLOROETHANE	10	U	10	UG/L			NIA	NIA
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CHLOROFORM	10	U	10	UG/L			5.7	0.16
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CHLOROMETHANE	10	U	10	UG/L			2.7	1.5
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CIS-1,2-DICHLOROETHENE	10	U	10	UG/L			70	61
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	CIS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	DIBROMOCHLOROMETHANE	10	U	10	UG/L			0.42	1
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	ETHYL BENZENE	10	U	10	UG/L			700	1300
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	METHYLENE CHLORIDE	10	U	10	UG/L			4.7	4.3
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	STYRENE	10	U	10	UG/L			140	1600
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	TETRACHLOROETHENE	10	U	10	UG/L			0.7	1.1
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	TOLUENE	10	U	10	UG/L			1400	720
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	TRANS-1,2-DICHLOROETHENE	10	U	10	UG/L			140	120
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	TRANS-1,3-DICHLOROPROPENE	10	U	10	UG/L			0.19	NIA
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	TRICHLOROETHENE	10	U	10	UG/L			3.2	1.6
Trip Blank	Q3008	7/26/95	WATER	VOC	0	0	VINYL CHLORIDE	10	U	10	UG/L			0.02	0.02
Trip Blank	Q3008	7/28/95	WATER	VOC	0	0	XYLENE (TOTAL)	10	U	10	UG/L			14000	1400
							WASTE PROFILE SAMPLES								
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,1,1-TRICHLOROETHANE	0.5	U	0.5	UG/L			630	1300
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,1,2,2-TETRACHLOROETHANE	0.5	U	0.5	UG/L			0.18	0.055
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,1,2-TRICHLOROETHANE	0.5	U	0.5	UG/L			0.61	0.2
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,1-DICHLOROETHANE	0.5	U	0.5	UG/L			NIA	810
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,1-DICHLOROETHENE	0.5	U	0.5	UG/L			0.06	0.046
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,2-DICHLOROBENZENE	1	U	1	UG/L			630	370
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,2-DICHLOROETHANE	0.5	U	0.5	UG/L			0.38	0.12
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,2-DICHLOROETHENE (TOTAL)	0.5	U	0.5	UG/L			NIA	NIA
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,2-DICHLOROPROPANE	0.5	U	0.5	UG/L			0.51	0.16
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,3-DICHLOROBENZENE	1	U	1	UG/L			620	NIA
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	1,4-DICHLOROBENZENE	1	U	1	UG/L			1.5	0.47
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	2-BUTANONE	0.5	U	0.5	UG/L			4200	1900
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	2-HEXANONE	0.5	U	0.5	UG/L			N	NIA

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	4-METHYL-2-PENTANONE	0.5	U	0.5	UG/L			NIA	2900
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	ACETONE	0.5	U	0.5	UG/L			700	610
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	BENZENE	1	U	1	UG/L			1.2	0.39
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	BROMODICHLOROMETHANE	0.5	U	0.5	UG/L			0.56	0.18
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	BROMOFORM	1	U	1	UG/L			4.4	8.5
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	BROMOMETHANE	1.5	U	1.5	UG/L			9.8	8.7
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CARBON DISULFIDE	0.5	U	0.5	UG/L			700	21
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CARBON TETRACHLORIDE	0.5	U	0.5	UG/L			0.27	0.17
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CHLOROBENZENE	0.8	U	0.8	UG/L			140	39
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CHLOROETHANE	1	U	1	UG/L			NIA	NIA
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CHLOROFORM	0.5	U	0.5	UG/L			5.7	0.16
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CHLOROMETHANE	1.5	U	1.5	UG/L			2.7	1.5
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CIS-1,2-DICHLOROETHENE	0.5	U	0.5	UG/L			70	61
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	CIS-1,3-DICHLOROPROPENE	0.5	U	0.5	UG/L			0.19	NIA
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	DIBROMOCHLOROMETHANE	0.5	U	0.5	UG/L			0.42	1
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	ETHYL BENZENE	1	U	1	UG/L			700	1300
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	METHYLENE CHLORIDE	2.1		1	UG/L			4.7	4.3
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	STYRENE	0.5	U	0.5	UG/L			140	1600
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	TETRACHLOROETHENE	1	U	1	UG/L			0.7	1.1
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	TOLUENE	1	U	1	UG/L			1400	720
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	TRANS-1,2-DICHLOROETHENE	0.5	U	0.5	UG/L			140	120
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	TRANS-1,3-DICHLOROPROPENE	0.5	U	0.5	UG/L			0.19	NIA
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	TRICHLOROETHENE	0.5	U	0.5	UG/L			3.2	1.6
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	VINYL CHLORIDE	1.5	U	1.5	UG/L			0.02	0.02
Trip Blank	Q3009	7/28/95	WATER	VOC	0	0	XYLENE (TOTAL)	1	U	1	UG/L			14000	1400
CONCRETE HARDFILL DRUM REMOVAL AREA, LF-26															
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	4,4'-DDD	0.1	U	0.1	UG/L			0.15	0.28
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	4,4'-DDE	0.1	U	0.1	UG/L			0.1	0.2
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	4,4'-DDT	0.1	U	0.1	UG/L			0.1	0.2
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aldrin	0.05	U	0.05	UG/L			0.002	0.004
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	alpha-BHC	0.05	U	0.05	UG/L			0.006	0.011
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	alpha-Chlordane	0.05	U	0.05	UG/L			0.03	0.052
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1016	1	U	1	UG/L			NIA	2.6
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1221	2	U	2	UG/L			0.005	0.73
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1232	1	U	1	UG/L			0.005	0.73
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1242	1	U	1	UG/L			0.005	0.73
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1248	1	U	1	UG/L			0.005	0.73
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1254	1	U	1	UG/L			0.005	0.73
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Aroclor-1260	1	U	1	UG/L			0.005	0.73
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	beta-BHC	0.05	U	0.05	UG/L			0.02	0.037
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	delta-BHC	0.05	U	0.05	UG/L			NIA	NIA
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Dieldrin	0.1	U	0.1	UG/L			0.002	0.0042
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Endosulfan I	0.05	U	0.05	UG/L			NIA	NIA
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Endosulfan II	0.1	U	0.1	UG/L			NIA	NIA

Appendix A
Summary of Validated Data
OU-5 Remedial Investigation
Williams Air Force Base, Arizona

Location	Sample Number	Sample Date	Matrix	Test Group	Begin Depth ft	End Depth ft	Parameter	Concentration	Qualifier	Detection Limit	Unit	Soil HBGL	Soil Resid PRG	Water HBGL ug/L	Water Resid PRG ug/L
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Endosulfan sulfate	0.1	U	0.1	UG/L			NIA	NIA
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Endrin	0.1	U	0.1	UG/L			2.1	11
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Endrin ketone	0.1	U	0.1	UG/L			NIA	NIA
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Heptachlor	0.05	U	0.05	UG/L			0.008	0.015
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Heptachlor epoxide	0.05	U	0.05	UG/L			0.004	0.0074
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Methoxychlor	0.5	U	0.5	UG/L			35	180
Meth. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	Toxaphene	5	U	5	UG/L			0.03	0.061
Eqp. Blank	Q3010	7/20/95	WATER	PESTPCB	0	0	gamma-BHC (Lindane)	0.05	U	0.05	UG/L			0.03	0.052
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	4,4'-DDD	0.1	U	0.1	UG/L			0.15	0.28
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	4,4'-DDE	0.1	U	0.1	UG/L			0.1	0.2
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	4,4'-DDT	0.1	U	0.1	UG/L			0.1	0.2
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aldrin	0.05	U	0.05	UG/L			0.002	0.004
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	alpha-BHC	0.05	U	0.05	UG/L			0.006	0.011
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	alpha-Chlordane	0.05	U	0.05	UG/L			0.03	0.052
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1016	1	U	1	UG/L			NIA	2.6
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1221	2	U	2	UG/L			0.005	0.73
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1232	1	U	1	UG/L			0.005	0.73
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1242	1	U	1	UG/L			0.005	0.73
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1248	1	U	1	UG/L			0.005	0.73
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1254	1	U	1	UG/L			0.005	0.73
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Aroclor-1260	1	U	1	UG/L			0.005	0.73
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	beta-BHC	0.05	U	0.05	UG/L			0.02	0.037
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	delta-BHC	0.05	U	0.05	UG/L			NIA	NIA
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Dieldrin	0.1	U	0.1	UG/L			0.002	0.0042
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Endosulfan I	0.05	U	0.05	UG/L			NIA	NIA
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Endosulfan II	0.1	U	0.1	UG/L			NIA	NIA
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Endosulfan sulfate	0.1	U	0.1	UG/L			NIA	NIA
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Endrin	0.1	U	0.1	UG/L			2.1	11
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Endrin ketone	0.1	U	0.1	UG/L			NIA	NIA
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	gamma-BHC (Lindane)	0.05	U	0.05	UG/L			0.03	0.052
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Heptachlor	0.05	U	0.05	UG/L			0.008	0.015
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Heptachlor epoxide	0.05	U	0.05	UG/L			0.004	0.0074
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Methoxychlor	0.5	U	0.5	UG/L			35	180
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	Toxaphene	5	U	5	UG/L			0.03	0.061
Eqp. Blank	Q3011	7/20/95	WATER	PESTPCB	0	0	gamma-BHC (Lindane)	0.05	U	0.05	UG/L			0.03	0.052

Sources: Arizona HBGL Values, January 1995 Update; EPA Region IX PRG Values, February 1, 1995 Update.
NOTES: J = Value is between detection limit and reporting limit. Value is estimated.
R = Reanalyzed.
U = Non-detect.
NIA = No information available.
NR = No record available.